TAPR TACGPS Development and Support Mailing List Archive, January 2000 through May 2002

January 2000 through May 2002

the development and support forum for TAPR's TAC-2 GPS precision-timing project, covering Motorola Oncore receivers, timing and frequency standards, NMEA data, firmware and software, circuit boards, assembly, testing, antennas, Unix tools, calibration, and scientific timing applications.

This volume contains 29 original monthly files and 953 messages, arranged chronologically. The PDF is a readable access copy: MIME transfer encodings are decoded, HTML bodies are converted to plain text, and non-text attachments are represented by descriptive notes. The raw source text is supplied separately with the Internet Archive item.

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2000-01	9	tacgps.0001
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Month	Messages	Original source file
2002-04	29	tacgps.0204
2002-05	15	tacgps.0205

January 2000

Original source file: tacgps.0001
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0001

1. [tacgps] Re: DGPS Problems

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Sun, 2 Jan 2000 9:33:17
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-57715-2000.01.02-09.49.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks, that did it (switching to 9600 Bps on the GBR-21). I put a switch
on the receiver for 4800 and 9600. Found the unit has to be powered off
and on for it to take the baud rate change.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: DGPS Problems

From: "Doug McKinney" <Design@mt.to>
Date: Mon, 3 Jan 2000 08:48:38 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-57982-2000.01.03-11.10.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Good news, thank you for the feedback.

Doug

----- Original Message -----
From: Brian Kirby <brian.kirby@msfc.nasa.gov>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Sunday, January 02, 2000 9:33 AM
Subject: [tacgps] Re: DGPS Problems

> Thanks, that did it (switching to 9600 Bps on the GBR-21). I put a switch
> on the receiver for 4800 and 9600. Found the unit has to be powered off
> and on for it to take the baud rate change.
>
> ---
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>

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3. [tacgps] New Kenwood Radio and DGPS?

From: Jeff Vollin <barnie@flash.net>
Date: Mon, 03 Jan 2000 21:08:22 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58112-2000.01.03-22.24.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anyone know if the new Kenwood TM-D700 mobile radio+
TNC will work with differential GPS? Presently, I use a Pico
Packet and it works great. The differential beacon sends its UI
packets to "RTCM" and the PicoPacket picks these up and
routes them to the GPS without any address headers (which
would confuse my Garmin GPS40). The GPS sends its NMEA
packets back to the PicoPacket which then sends them over
the air to all those waiting APRS stations.

I sent this question to Kenwood, but they just referred me
to the net rather than answering. (Customer service: C-)

Jeff Vollin
KC6WFU

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4. [tacgps] APRS map generation

From: "KPo_LH Mobilradio A/S" <kpo@lhmobil.dk>
Date: Sun, 16 Jan 2000 01:10:09 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "TAPR APRS Special Interest Group" <aprssig@lists.tapr.org>
Message-ID: <LYR6754-60716-2000.01.15-18.16.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have for some month worked - on and off - to be able to generate maps for "our little and happy kingdom of denmark".

I have never met any danes working with APRS and I would very much like to create some interest, so Denmark could be added to the countries where APRS are in use.
In my profession I work with PMR, GPS, Vector Based mapping systems so the background is OK.
I have tried a couple of times with few years interval to "get on a friendly level with APRS" but with same "obstruction" as now - the MAPS.
I think this is the major reason for the very slow penetration outside US, and I would very much like some guidance, to be informed if I have found the tools available.
In the DOS version of APRS I found the MAPFIX40.EXE (If You download the WIndows version You will never find out of its exsistance) which is fo me is giving the ability to draw maps point by point, and besides that, there is not much to gain, as import facilities is not useable due to local map formats.
I found also the very nice DXF2MAP written by VK2TDS, and succeded in few instances to convert a UTM DXF file to WINAPRS but all the labels ended up in US !!!. In the least I enjoyed to se myself placed in the right position, using my AEA MBX202 and the PIC-E board as the receiver. Win APRS did read the UTM format OK, but any attemp to convert a lat - long format has failed so far. The DXF2MAP does not function as intended, as mostly it gives error messages or never finish the task so a lot of time wasted experiamenting with it. Conversion of any of the APRS MAP's has never succeded either. I have a communication ongoing with VK2TDS, but not heard from him for a long time, he is probably enjoying the hot summer time.

So my Question is:
Is there any other tools available, for the PC Platform, for generation of MAPS or tools which might be able to convert UTM based DXF files ??? (I am not the happy owner of a MAC !!)

Kind regards

Kurt de OZ7OU

5. [tacgps] Re: APRS map generation

From: Bob Bruninga <bruninga@nadn.navy.mil>
Date: Sat, 15 Jan 2000 19:20:58 -0500 (EST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR Special Interest Group <tacgps@lists.tapr.org>,
TAPR APRS Special Interest Group <aprssig@lists.tapr.org>
Message-ID: <LYR6754-60721-2000.01.15-18.37.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Glad to hear of your work. If you have an APRSdos maps, I would love to add them to my EUropean maps. Also, the LABELS are in the wrong hemisphere because when APRS begain, we had no idea it would be global. SImply use a (-) sign for longitudes to put them in the East. (Backwards from normal convention)..

I assume you have my EUmapsxx file and other european files?

de WB4APR, Bob

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6. [tacgps] Sv: Re: APRS map generation

From: "Kurt Poulsen" <lhmobil@post4.tele.dk>
Date: Sun, 16 Jan 2000 15:57:26 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60834-2000.01.16-09.03.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Bob

Thank You for the reply.

I am aware of the - sign, and that is probably what is wrong with the DXF2MAPS.exe, as this problem should be taken care of this software when converting from a UTM DXF file. I suppose I have all the Europen maps at hand, from the TAPR site.

I will of cause provide You with my results when available, provided I am not running into a legal issue
 regarding the commercial rights to the maps from my source. Despite that I will provide a map, in any
case, who is much better than the "11 lines in two rows" which is Denamrk on the present maps, HI !!!

By the way I think You should improve the TAPR site (to Your benefit) as there is no information how to
register the software !! That is why I still run the software unregistred. I will soon find out one way
or the other and get registred.

Kind regards

Kurt de OZ7OU

www.lhmobil.dk has a personal resume.

----- Oprindelig meddelelse -----
Fra: Bob Bruninga <bruninga@nadn.navy.mil>
Til: TAPR Special Interest Group <tacgps@lists.tapr.org>
Cc: TAPR Special Interest Group <tacgps@lists.tapr.org>; TAPR APRS Special Interest Group
<aprssig@lists.tapr.org>
Sendt: søndag, januar 16, 2000 01:20
Emne: [tacgps] Re: APRS map generation

> Glad to hear of your work. If you have an APRSdos maps, I would love to
> add them to my EUropean maps. Also, the LABELS are in the wrong
> hemisphere because when APRS begain, we had no idea it would be global.
> SImply use a (-) sign for longitudes to put them in the East. (Backwards
> from normal convention)..
>
> I assume you have my EUmapsxx file and other european files?
>
>
> de WB4APR, Bob
>
>
>
> ---
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>

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7. [tacgps] Re: Sv: Re: APRS map generation

From: Bob Bruninga <bruninga@nadn.navy.mil>
Date: Sun, 16 Jan 2000 10:48:12 -0500 (EST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60838-2000.01.16-10.04.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Sun, 16 Jan 2000, Kurt Poulsen wrote:

> By the way I think You should improve the TAPR site (to Your benefit)
> as there is no information how to register the software !! That is why I
> still run the software unregistred. I will soon find out one way or the
> other and get registred.

THanks for the suggestion, but just hit F1-V within APRSdos or hit
F1-FILES-REGISTER

I just zoomed in on Denmark, and you are right! Nothing but the coast
line...

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8. [tacgps] Sv: RE: WGS84 to UTM conversion

From: "Kurt Poulsen" <lhmobil@post4.tele.dk>
Date: Mon, 17 Jan 2000 01:43:38 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60888-2000.01.16-18.50.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello 'Richard

How accurate does You expect to convert few mm region or is 5 to 10 cm ok ?? In that case I have software which converts within 10 cm. If lesser accuracy required I have access to SW in the 1-2 cm region. In case gice me some coordinates to convert.

73 de OZ7OU / Kurt
----- Oprindelig meddelelse -----
Fra: Richard M. Hambly <rick@cnssys.com>
Til: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sendt: tirsdag, september 21, 1999 11:03
Emne: [tacgps] RE: WGS84 to UTM conversion

Francisco,

I use the Geographic Calculator from Blue Marble Geographics, see http://www.bluemarblegeo.com/products.asp?id=1. If you send me some coordinates I will convert them so you have some reference data.

Rick
WB2TNL

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org [mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Francisco José Millán Benayas
Sent: Tuesday, September 21, 1999 5:49 AM
To: TAPR Special Interest Group
Subject: [tacgps] RE: WGS84 to UTM conversion

Hi,

    I have some source code for converting from wgs84 coordenades (lat/lon) to ED50 UTM. I am looking for data to test the accuracy of the code. Does anybody know where can I found data, position in both formats to test the rutines?

Thanks.
Francisco.

****
Francisco José Millán Benayas

DATATRONICS, S.A.   Dep. I+D
Tlf: 34-913 86 38 38 Fax: 34-913 73 26 46
e-mail: francisco.millan@datatronics.es
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9. [tacgps] RE: Sv: RE: WGS84 to UTM conversion

From: "Daniel J. Bernal" <dabernal@cantv.net>
Date: Mon, 17 Jan 2000 09:34:20 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60962-2000.01.17-07.43.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello All,

Any body knows where can I buy lo cost OEM GPS board for 50+ units?

Thank you.

Daniel Bernal

daniel@bernal.com

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February 2000

Original source file: tacgps.0002
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0002

1. [tacgps] Dividers/Counters

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Thu, 3 Feb 2000 6:55:50
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64231-2000.02.03-06.53.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If have been out of the digital world for about 15 years. I need to build
a divider to bring my 10 Mhz output of a rubidium down to 1 PPS. What
chips are being used now days? I sure there are better units than the old
7490s.......Thanks, Brian

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2. [tacgps] Re: Dividers/Counters

From: "Lyle Johnson" <wa7gxd@email.msn.com>
Date: Thu, 3 Feb 2000 13:10:59 -0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64232-2000.02.03-07.06.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Nowadays most folks use FPGAs or PLDs or CPLDs.

Check the websites of Lattice Semiconductor, Altera, Xilinx, QuickLogic and
Atmel for starters.

QuickLogic will give you free tools and program a part to your design and
FedEx it to you for free -- but you'll have to lay out your PCB for surface
mount, or at least a socketed PLCC form-factor chip.

73,

Lyle

> If have been out of the digital world for about 15 years. I need to build
> a divider to bring my 10 Mhz output of a rubidium down to 1 PPS. What
> chips are being used now days? I sure there are better units than the old
> 7490s.......Thanks,

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3. [tacgps] Re: Dividers/Counters

From: Gary Thurmond <w6str@redshift.com>
Date: Thu, 03 Feb 2000 08:02:31 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64245-2000.02.03-09.59.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian,

Checkout -

Brooks Shera's GPS-Related Projects
http://www.rt66.com/~shera/

For -

"PIC16C84 frequency divider code (zip format, 4 K bytes) "
This project divides 10 MHz down to 9 outputs ranging from 100 Khz to
0.001 Hz.

I put this project together in a few hours. Use a PIC16F84 and the
serial port programmer circuit from October 1998 QST, pg. 34. The QST
article has references to programming software and other PIC resources.

73'

Gary

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4. [tacgps] Re: Dividers/Counters

From: Brooks Shera <ebs@lanl.gov>
Date: Thu, 3 Feb 2000 09:06:57 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64246-2000.02.03-10.00.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Lyles' PLD solution is a good one, but if you want something off-the-shelf
you might try a couple of 74HCT4059's (programmable divide by N) in
series.
Each one can divide by anything up to 10,000, which is why you'll
need two.

Or, if you would rather program a PIC (16C84) than a PLD you could use the
code of Tom Van Baak that gives you all the decade outputs from 100 kHz
to 0.001 Hz from a 10 MHz input. It's hard to beat that.

The PIC code is on my webpage at www.rt66.com/~shera

Brooks

>Nowadays most folks use FPGAs or PLDs or CPLDs.
>
>Check the websites of Lattice Semiconductor, Altera, Xilinx, QuickLogic and
>Atmel for starters.
>
>QuickLogic will give you free tools and program a part to your design and
>FedEx it to you for free -- but you'll have to lay out your PCB for surface
>mount, or at least a socketed PLCC form-factor chip.
>
>73,
>
>Lyle
>
>> If have been out of the digital world for about 15 years. I need to build
>> a divider to bring my 10 Mhz output of a rubidium down to 1 PPS. What
>> chips are being used now days? I sure there are better units than the old
>> 7490s.......Thanks,

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5. [tacgps] Re: Dividers/Counters

From: tvb@veritas.com (Tom Van Baak)
Date: Thu, 3 Feb 2000 08:09:30 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64247-2000.02.03-10.09.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> If have been out of the digital world for about 15 years. I need to build
> a divider to bring my 10 Mhz output of a rubidium down to 1 PPS. What
> chips are being used now days? I sure there are better units than the old
> 7490s.......Thanks, Brian

I had a similar need a while back. You can reduce the parts
count by 1/2 using '390 parts (dual decade).

But what I'm using now is one IC - a simple microcontroller.
The basic idea is to use the 10 MHz Rb output as the clock
input for the uP and then write assembly code that toggles
an output pin exactly every five million CPU instruction
cycles. The result is a 50% duty cycle 1 PPS output with
subnanosecond jitter. See:

  http://www.rt66.com/~shera/index_fs.htm
  http://www.rt66.com/~shera/ppsdiv.zip -- source code

/tvb

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6. [tacgps] Re: Dividers/Counters

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 03 Feb 2000 19:01:57 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR Special Interest Group <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64274-2000.02.03-12.59.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> If have been out of the digital world for about 15 years. I need to build
> a divider to bring my 10 Mhz output of a rubidium down to 1 PPS. What
> chips are being used now days? I sure there are better units than the old
> 7490s.......Thanks, Brian

Brian -- in addition to all the other responses on this topic, I'll
add mine. A couple of years ago I did a divider chain to do precisely
this. Rather than using grubby TTL, my design used HC series CMOS.

The schematic of my divider chain, including 1PPS synchronization,
pulse drivers, etc is on my personal FTP site at GSFC at URL

       ftp://tac.gsfc.nasa.gov/pub/1PPS_counter.pdf

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: Dividers/Counters

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Thu, 3 Feb 2000 14:46:28 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64283-2000.02.03-13.43.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dr. Thomas A. Clark wrote:
>Brian -- in addition to all the other responses on this topic, I'll
>add mine. A couple of years ago I did a divider chain to do precisely
>this. Rather than using grubby TTL, my design used HC series CMOS.

>The schematic of my divider chain, including 1PPS synchronization,
>pulse drivers, etc is on my personal FTP site at GSFC at URL

 >   ftp://tac.gsfc.nasa.gov/pub/1PPS_counter.pdf

This is exactly what I have been looking for also.
Is there a PC board for this circuit out there somewhere?
Better yet, could one be made available through TAPR?
OR maybe a complete kit? Check book is in hand.

73   John   W4SF

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8. [tacgps] Re: Dividers/Counters

From: Brooks Shera <ebs@lanl.gov>
Date: Thu, 3 Feb 2000 13:39:24 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64291-2000.02.03-14.32.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>Tom Clark wrote:

>The schematic of my divider chain, including 1PPS synchronization,
>pulse drivers, etc is on my personal FTP site at GSFC at URL

Perhaps I miss the point from Tom's brief description, but if
you generate at 1 pps pulse by dividing a 10 MHz Rb and then sync
it to the 1 pps from GPS, what is the function of the Rb?

Brooks

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9. [tacgps] Re: Dividers/Counters

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Fri, 04 Feb 2000 03:54:02 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64349-2000.02.03-21.51.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks Shera wrote:
>
> Perhaps I miss the point from Tom's brief description, but if
> you generate at 1 pps pulse by dividing a 10 MHz Rb and then sync
> it to the 1 pps from GPS, what is the function of the Rb?

In the schematic, the 1PPS sync allows you to initially set the
1PPS divider chain to be in step with GPS. The 74HC132 latch in the
schematic is armed with a push button switch to synch the dividers
to the next GPS 1PPS signal. You then watch the 1PPS derived from
the Rb drift w.r.t. GPS over time scales of hours to days to tweak
the Rb onto frequency (~1 usec/day of drift means a ~1:10e11
frequency error).

BTW -- to get from 10 MHz to 1 PPS requires only 7 stages of decade
counters. Since the schematic used 74HC390's with 2 stages/chip,
the 8th stage is used in a "trick" circuit that generates a 200 msec
wide pulse at the start of the second. The 200 msec width nicely
matches the 200 msec pulse that the Motorola ONCOREs produce.

The schematic shows an optional doubler that can be used to make
10 MHz from a 5 MHz oscillator, or it can be used to make the
20 MHz clock that is used in the DDS master oscillator in many
Icom/Kenwood/Yaesu radios if you have a 10 MHz oscillator.

To answer the other question from John (W4SF) -- no I never bothered
to lay out a circuit board. My counter chain was built using perf
board with point-to-point wiring.

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Re: Dividers/Counters

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Fri, 4 Feb 2000 6:19:11
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64414-2000.02.04-06.16.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Actually, I will not be syncing the GPS directly. The 1 PPS will be used
for checking drift of the rubidium. You put the 1 PPS from the GPS into a
stop/start counter and the 1 PPS from the rubidium. This gives you a time
difference between the gps and the rubidium. After watching it, over a
period of time, you can determine when to calibrate it.

When I was in the Air Force, we had two cesium beam units and we use to
measure the time difference every day between the two clocks. Once a week,
we went on the air and check the time between our primary clock and the
other satellite station. We reported these measurements (typically less
than a couple of microseconds) to USNO. The would send a message back
about 3 to 6 months, having you to retard or advance the clock by x
microseconds. The USNO also sent a team once a year with a portable clock
to verify the whole chain (I beleive there was close to 60 clocks they kept
up with, at the time).

I probally end up using something simular to Dr. Clarks designs. I didn't
tell the whole story, but from the Rubidiums 10 Mhz output, I need 5 Mhz, 1
Mhz and the 1 PPS. The 5 Mhz and 1 Mhz will be used to slave various test
equipment.

In the past I had used 7490s as dividers (/2 & /5 or /10) for a 5 Mhz
oscillator I had from FEI. They worked, but I had to use a lot of them.

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11. [tacgps] Re: Dividers/Counters

From: Tom Van Baak <tvb@veritas.com>
Date: Fri, 04 Feb 2000 11:10:49 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64477-2000.02.04-13.17.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> Actually, I will not be syncing the GPS directly. The 1 PPS will be used
> for checking drift of the rubidium. You put the 1 PPS from the GPS into a
> stop/start counter and the 1 PPS from the rubidium. This gives you a time
> difference between the gps and the rubidium. After watching it, over a
> period of time, you can determine when to calibrate it.

If you want to cheat a one or two stage decade counter is all
you need in this case. Put the GPS 1 PPS in the start channel
of your TI counter and the (10 MHz divided by 100) in the stop
channel. The TI values you get will drift between 0 to 10,000
ns and by watching the average TI change over hours or days
you'll be able to calibrate your Rb exactly as if you had
implemented the full seven stage decade divider!

/tvb

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12. [tacgps] RE: Dividers/Counters

From: "Ron L. Sparks" <spark51@attglobal.net>
Date: Fri, 4 Feb 2000 21:21:47 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64535-2000.02.04-21.19.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian,

I am sure you already know this, but the GPS 1PPS is not "instantaneously"
stable -- it has SA jitter in it. Brooks Shera did a great analysis of this
in some of his work. You can see a graph of this jitter at
http://www.rt66.com/~shera/gps-Rb%20phase.JPG . If you are going to use it
to correct to then you will also need to integrate/average over a long time
period. Brooks recommended at least 30 min.,but I like your suggestion of a
couple of days even better.

My point is, by the time you add that requirement to your hardware design,
IMHO, the PIC microcontroller beats the pure hardware approach hands down.

As others have mentioned, I would highly recommend visiting Brooks' site at
http://www.rt66.com/~shera/ before you start etching copper.

Ron
KC5ODM

> -----Original Message-----
> From: bounce-tacgps-5718@lists.tapr.org
> [mailto:bounce-tacgps-5718@lists.tapr.org]On Behalf Of Brian Kirby
> Sent: Friday, February 04, 2000 12:19 AM
> Subject: [tacgps] Re: Dividers/Counters
>
>
> Actually, I will not be syncing the GPS directly. The 1 PPS
> will be used
> for checking drift of the rubidium. You put the 1 PPS from the
> GPS into a
> stop/start counter and the 1 PPS from the rubidium. This gives
> you a time
> difference between the gps and the rubidium. After watching it, over a
> period of time, you can determine when to calibrate it.

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13. [tacgps] Dividers/Counters

From: Brooke Clarke <brooke@pacific.net>
Date: Sat, 05 Feb 2000 10:22:13 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64609-2000.02.05-12.19.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Brian:

A few years ago I was doing a similar thing using a high quality xtal
oscillator.
I ended up using LabVIEW to plot the difference between the two 1 PPS signals.
I found that the Motorola saw tooth error signal had glitches that were in the
same direction
and therefore can not be averaged out. It's better to just average the SA
noise.
Then fit a parabolic curve to the difference data.
It takes many hours of this before the quality of fit is good enough to use.

You will end up with both the offset and drift rate.

73,

Brooke

> Subject: Re: Dividers/Counters
> From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
> Date: Fri, 4 Feb 2000 6:19:11
> X-Message-Number: 1
>
> Actually, I will not be syncing the GPS directly. The 1 PPS will be used
> for checking drift of the rubidium. You put the 1 PPS from the GPS into a
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> period of time, you can determine when to calibrate it.
>
> When I was in the Air Force, we had two cesium beam units and we use to
> measure the time difference every day between the two clocks. Once a week,
> we went on the air and check the time between our primary clock and the
> other satellite station. We reported these measurements (typically less
> than a couple of microseconds) to USNO. The would send a message back
> about 3 to 6 months, having you to retard or advance the clock by x
> microseconds. The USNO also sent a team once a year with a portable clock
> to verify the whole chain (I beleive there was close to 60 clocks they kept
> up with, at the time).
>
> I probally end up using something simular to Dr. Clarks designs. I didn't
> tell the whole story, but from the Rubidiums 10 Mhz output, I need 5 Mhz, 1
> Mhz and the 1 PPS. The 5 Mhz and 1 Mhz will be used to slave various test
> equipment.
>
> In the past I had used 7490s as dividers (/2 & /5 or /10) for a 5 Mhz
> oscillator I had from FEI. They worked, but I had to use a lot of them.
>
> --

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] GPS Timing Accuracy Comments

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 06 Feb 2000 17:32:51 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64753-2000.02.06-11.30.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooke Clarke wrote:
>
> Hi Brian:
>
> A few years ago I was doing a similar thing using a high quality xtal
> oscillator.
> I ended up using LabVIEW to plot the difference between the two 1 PPS signals.
> I found that the Motorola saw tooth error signal had glitches that were in the
> same direction

> and therefore can not be averaged out. It's better to just average the SA
> noise.

Since I've probably done as much on this general topic as anyone in the
world, I guess I need to chime in with some comments.

First, by explanation, I started my original TAC developments in ~1993
as a way to provide epoch time synchronization and rate accuracy
syntonization at the international network of Very Long Baseline
Interferometry (VLBI) stations. You can gelan some info on VLBI at
my group's web site at http://lupus.gsfc.nasa.gov, at the Internation
Communities web site at http://ivscc.gsfc.nasa.gov and at the
USNO at http://maia.usno.navy.mil/VLBI/

Each VLBI station has a Hydrogen Maser standard which provides a
very stable reference oscillator. Any clock consists of an oscillator
and a counter [if this concept surprises you, or if you are a
newcomer to precise timekeeping, I suggest you read the wonder
tutorial in HP Application Note 1289 entitled "The Science of
Timekeeping". A PDF version is available on my FTP site at URL
ftp://tac.gsfc.nasa.gov/pub/hpan1289.pdf and while you are at it,
also pick up the HP AN1272 GPS Timing tutorial at URL
ftp://tac.gsfc.nasa.gov/pub/hpan1272.pdf].

My TAC developments in 1994 evolved to using the original Motorola
PVT-6 receiver, the 6-channel predecessor of the ONCOREs and in
1995 I provided an itital batch of 6-channel TAC-1 receivers to
the VLBI community.

Brooke talks about 104 nsec sawtooth -- you can see it in action
in the GIF plot at URL ftp://tac.gsfc.nasa.gov/pub/tac-1sec.gif
The 104 nsec period arises because the ONCORE produces it's 1PPS
pulses at clock pulses derived from a 9.54... MHz oscillator with
no sub-cycle resolver. All tests I have done show that when you
average over a number of cycles (like 50 or more, i.e. a minute
or so), the sawtooth effects average out with zero mean value.
The periodicity of the sawtooth varies with temperature, with
the specific constellation in view (with discontinuities when
satellites pop into view), with SA, etc, but it is a zero-mean
process so it does average out.

Many of us have made determinations of the power spectrum of
Selective Availability. SA is a band-limited process with no
dither modulation with spectral components faster than a few
seconds. On the low-frequency (long time interval) end, the
slowest modulation is at periods ~30 minutes. When you average
for an hour or more, the effects of SA drop out.

Personally, I recommend that anyone who is going to try to understand
time/frequency performance of clocks should become familiar withh
the Allan Variance. I have my "consensus" version of the AVAR
showing most standard frequency standards posted at URL
ftp://tac.gsfc.nasa.gov/pub/avar.gif.

In the binary messages sent by the ONCORE, Motorola has included
a one-byte (-127 to 127 nsec) number that reports the sawtooth
error of the next 1PPS pulse. Rick (WB2TNL) at CNS Systems has
included the sawtooth correction as a part of his professional
TAC32Plus software. This software includes logging readings of the
1PPS pulse timing using an HP53131 or 53132 series counter.
Since the H-Maser clock is better than GPS at all time scales
up to weeks, I used the TAC&TAC32+&Maser combination to generate
the Allan Variances of current generation ONCORE receivers
with the "nude" 1PPS output vs 100 second averaging vs applying
the sawtooth correction. That data can be see in the plot at URL
ftp://tac.gsfc.nasa.gov/pub/avar-saw.pdf. It can be seen that
for time scales up to ~100 seconds, the sawtooth correction
is an order-of-magnitude improvement over the "nude" pulse.

If you want to see how a Maser compares with GPS over a month,
take a look at ftp://tac.gsfc.nasa.gov/pub/ggao.pdf and a
6-week comparison with an old 6-channel TAC-1 can be seen in
ftp://tac.gsfc.nasa.gov/pub/oso-clk.gif (GGAO is my
Goddard Geophysical & Astronomical Obsv. here in Maryland,
OSO is the Onsala Space Obsv south of Gothenburg, Sweden).

Regards -- Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: GPS Timing Accuracy Comments

From: reg@dwf.com
Date: Sun, 06 Feb 2000 12:50:02 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64777-2000.02.06-13.47.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just a quick addition to Toms message

> Rick (WB2TNL) at CNS Systems has
> included the sawtooth correction as a part of his professional
> TAC32Plus software.

The Oncore driver in the NTP v4 software also makes use of the sawtooth
correcton

Reg.Clemens
reg@dwf.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] RE: GPS Timing Accuracy Comments

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Mon, 7 Feb 2000 08:07:06 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64870-2000.02.07-08.04.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom- Thanks for the (as always!) excellent explaination on your work. One minor tweak is possible: The Allan Variance link which pointed to a .gif file needed to point to a .pdf file instead (as below).

"Personally, I recommend that anyone who is going to try to understand time/frequency performance of clocks should become familiar withh the Allan Variance. I have my "consensus" version of the AVAR showing most standard frequency standards posted at URL ftp://tac.gsfc.nasa.gov/pub/avar.pdf." <<< link corrected to read .pdf instead of .gif

I thought part of the previous discussion was centered around the differences between using test equipment (HP & LabVIEW control SW) vs. using a dedicated setup like Shera's, but there were multiple 'mini-threads' going through both commentor's posts, so I stayed out. Perhaps though, the question still remains: Is there any real difference between the achievable accuracy between the two techniques? Any preference? (and why?)

Just to be clear, the two techniques are:

1. A reference oscillator with a divider (perhaps like the one for which you posted your schematic recently) feeding a decent quality HP time interval counter which has a computer collecting readings and performing long term averaging.

2. A reference oscillator used with Shera's GPS PIC controller as featured in QST.

Both techniques for the purposes of this comparison would use the same GPS receiver (say a VP in fixed position mode with a good clear sky antenna location).

I have enough pieces to put together one or both of these setups, and would appreciate any comments towards making a (short term) choice. (Also if there's any LabVIEW code laying around which might be 're-used', please let me know... :o)

Thanks!

73's
Gary N8DMT

Gary Mastenbrook, Technology Manager, Motorola Telematics
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email.mot.com

Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Dr Thomas A Clark (W3IWI) [mailto:tac@clark.net]
Sent: Sunday, February 06, 2000 11:33 AM
To: TAPR Special Interest Group
Subject: [tacgps] GPS Timing Accuracy Comments

Brooke Clarke wrote:
>
> Hi Brian:
>
> A few years ago I was doing a similar thing using a high quality xtal
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USNO at http://maia.usno.navy.mil/VLBI/

Each VLBI station has a Hydrogen Maser standard which provides a
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the specific constellation in view (with discontinuities when
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seconds. On the low-frequency (long time interval) end, the
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the Allan Variance. I have my "consensus" version of the AVAR
showing most standard frequency standards posted at URL
ftp://tac.gsfc.nasa.gov/pub/avar.pdf.   <<fixed link! N8DMT >>

In the binary messages sent by the ONCORE, Motorola has included
a one-byte (-127 to 127 nsec) number that reports the sawtooth
error of the next 1PPS pulse. Rick (WB2TNL) at CNS Systems has

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If you want to see how a Maser compares with GPS over a month,
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6-week comparison with an old 6-channel TAC-1 can be seen in
ftp://tac.gsfc.nasa.gov/pub/oso-clk.gif (GGAO is my
Goddard Geophysical & Astronomical Obsv. here in Maryland,
OSO is the Onsala Space Obsv south of Gothenburg, Sweden).

Regards -- Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: Dividers/Counters

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Mon, 7 Feb 2000 09:40:03 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64874-2000.02.07-08.37.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom --

I am collecting parts for your 74HC390 divider chain project.
Do you have a suggested value for C2 in the input/doubler circuit?
I am using a 5 MHz reference oscillator.

Thanks.

John W4SF

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] Windows 2000 & GPS

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 7 Feb 2000 9:22:37
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64877-2000.02.07-09.20.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My computer that I had Tac32 on, was a NT4.0 machine. Over the weekend, I
put Windows 2000 on it.

It has a problem with the mouse and GPS. The NoSerialMouse switch does not
work under Windows2000 in the boot.ini file.

To get around it, I boot the machine with the GPS disconnected, and then
its OK.

If you boot it with the GPS, it loads the microsoft intellipoint ball mouse
drivers and reserves the comm ports. And the mouse jumps all over the
screen.

Anybody heard of a work-around for this ?

2000 gave me another problem, involving the modem, but I was able to fix
it. Otherwise, 2000 works. Can't see much difference between NT and
2000.

Ironically, some of the documentation on the CD refers to it, as NT5 !

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19. [tacgps] Time Measurement

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 7 Feb 2000 9:24:51
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64878-2000.02.07-09.22.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

With the effects of SA on a time interval measurement with GPS, is it
viable to go back to a phase detector and strip chart recorder ? I do not
have a computing type frequency counter (HP5245M).

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] Using a Trimble SV6-CM3 with the TAC-2

From: "William Van Buskirk" <wevb@nfis.com>
Date: Mon, 7 Feb 2000 9:51:42
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64885-2000.02.07-09.49.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi All,
I am new to the list and have a question for the groop. Has any one used a
Trimble SV6 module with the TAC-2? There is a referance to the module for
straping JP4, but I don't see any mention of the SV6 in the instructions. I
haven't found any spec sheets on the Trimble web site that relate to this
module. My main issue is the Rx/Tx lines, are they inverted as the SK8
model?
Thanks and 73 de KB0ODJ,
Bill

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Re: GPS Timing Accuracy Comments

From: Brooks Shera <ebs@lanl.gov>
Date: Mon, 7 Feb 2000 11:19:33 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64908-2000.02.07-12.12.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A comment on the comments

>Tom Clark wrote:

>Many of us have made determinations of the power spectrum of
>Selective Availability. SA is a band-limited process with no
>dither modulation with spectral components faster than a few
>seconds. On the low-frequency (long time interval) end, the
>slowest modulation is at periods ~30 minutes. When you average
>for an hour or more, the effects of SA drop out.

The last statement - that averaging, such as you might do
with an HP53131, over an hour will remove the effects of SA might
be misleading. Averaging is a low pass filtering method,
but not a very efficient one. It relies on taking N measurements
of the "random" signal and computing the mean, which reduces the
noise be sqrt(N). Thus, doubling the averaging time only reduces
the SA jitter by sqrt(2), e.g., 3 db in going from a 1/2 hour to a
one hour average.

Obviously, filters with much sharper low freq cutoffs can constructed.
For example, the digital filter used in my GPS controller has a
6 db per octave cutoff and sharper ones can readily be made if
one is not concerned about the phase shift issues that become important
in making a closed-loop feeedback controller.

So the message is: if your aim is to compare your Rb with GPS use a
better low pass filter than simple averaging.

A related item: if you need a phase detector with analog and ASCII
outputs to compare GPS 1 PPS and a freq standard and you don't have
an HP timer, you might consider just using the one in my GPS controller.

Make the controller, but don't bother with the DAC output. You can
collect the ASCII data on your computer for filtering/fitting, or
even record the analog output on your chart recorder!

If there is enough interest I guess I could program a PIC version with
selectable time-constant sharp cutoff filtering. That way you could
just look at a meter once in a while to see how your Rb was doing.

Brooks

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22. [tacgps] Re: GPS Timing Accuracy Comments

From: John Ackermann <jra@febo.com>
Date: Mon, 07 Feb 2000 13:52:52 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64916-2000.02.07-12.50.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In message <LYR5592-64908-2000.02.07-12.12.51--JRA#FEBO.COM@lists.tapr.org>, Br
ooks Shera writes:

>A related item: if you need a phase detector with analog and ASCII
>outputs to compare GPS 1 PPS and a freq standard and you don't have
>an HP timer, you might consider just using the one in my GPS controller.
>Make the controller, but don't bother with the DAC output. You can
>collect the ASCII data on your computer for filtering/fitting, or
>even record the analog output on your chart recorder!
>
>If there is enough interest I guess I could program a PIC version with
>selectable time-constant sharp cutoff filtering. That way you could
>just look at a meter once in a while to see how your Rb was doing.

I like this idea, Brooks. I've wondered whether fully controlling the
Rb is really worth the effort, versus a simple way to accurately determine
the offset and adjust accordingly. That elminates any lingering concern
of the impact of steering on the short-term stability. Count me in as
interested.

73,
John N8UR
jra@febo.com

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23. [tacgps] RE: Using a Trimble SV6-CM3 with the TAC-2

From: "Ron L. Sparks" <spark51@attglobal.net>
Date: Mon, 7 Feb 2000 21:40:45 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64962-2000.02.07-21.38.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bill,

I have asked about the SV6 here before and basically no one replied. As
best as I can tell, the SV6 is not directly compatible with the TAC software
because the SV6 puts out TAIP (Trimble ASCII Interface Protocol) and not the
NMEA statements the software needs. You need to check closely on what model
SV6 you have since some of them can be put into the NMEA mode while others
cannot.

On the other hand, the 1 pps output of the SV-6 will drive the TAC hardware
fine. It is a 400uS negative going pulse so the inverter section is needed.
Sorry, but I have not looked at the RX/TX lines yet to see what they need.

Also you need to be aware that at least all of the SV-6 units that I have
put my hands on in the surplus market are not WNRO compatible. Everything
will work fine, but the date will be one Unix epoch too high so the date and
year will read something in the 2100 range.

As for Trimble data, it is hard to find, but here is some I have managed to

"ferret out":

ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6_5_10.pdf = Press release about
week rollover compatibility
ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6_5_12.pdf = Press release about
week rollover compatibility
ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6pre5_04.pdf = Press release about
week rollover compatibility

ftp://ftp.trimble.com/pub/tracking/pla400-TAIP-Reference.pdf = TAIP
reference manual
ftp://ftp.trimble.com/pub/tracking/pla400-Inst&OpsManual.pdf = Placer 400
info, uses SV-6 engine
ftp://ftp.trimble.com/pub/tracking/pla400-GPS-StarterKit.exe = Useful
software

http://www.trimble.com/products/pdf/svee8p.pdf = Product data sheet for the
SVee8, quite similar to the SV6

I have a copy of some of the old software that came with the SV6, but really
it wouldn't do you much good. The above references will be the most help,
particularly the GPS-StarterKit.

Good luck and stay in touch -- apparently there are only a couple of us that
think the $40-70 new surplus price for the SV6 is a good buy.

Ron
KC5ODM

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24. [tacgps] Software for extract the date from the gps time.

From: "Francisco Jose Millan Benayas" <francisco.millan@datatronics.es>
Date: Tue, 8 Feb 2000 13:07:20 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65007-2000.02.08-06.13.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,
    I would like to know if there exists some software to extract the actual date from the gps time and
the counter of weeks. If there is no software, anyone knows abot the algorithms to work out the date
from the gps time and the counter of weeks.
Thanks.
Francisco.

****
Francisco Jose Millan Benayas

DATATRONICS, S.A.   Dep. I+D
Tlf: 34-913 86 38 38 Fax: 34-913 73 26 46
e-mail: francisco.millan@datatronics.es
****

25. [tacgps] RE: Using a Trimble SV6-CM3 with the TAC-2

From: Doug Bade <doug@clecom.com>
Date: Tue, 08 Feb 2000 13:34:58 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65012-2000.02.08-07.31.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am sorry no one else is posting answers, I tend to let others with more
experience do so but in this case, I will try.
THE svee-six cm3 modules I have are all flash programmable. the flash
software is available at the trimble site. Manuals were available for the
asking from Trimble as of August of last year. Their version of NMEA does
not support the RMC sentence (I think TAC32 wants it).. It does output GGA
and VTG which produce the same info.. also does output GSV as I recall. I
use mine for Trackers not for TAC32 (Motorola encore here). I beleive TAC32
will use it ok, and as I recall it supports comms to several specified
GPS's including Trimble.. TAC32 web site may specify, if not program
configuration will tell.. EMAIL me directly if you need more info/docs as I
have the svee-six cm3 bible at the office. The Flash files are keyed to the
model # on the small label on the chip like 32393 or such.. .. 73, doug KB8GVQ

P.S.

Input/output is TTL (inverted) you will need an rs232 driver like max232
or such. The TAPR TAC board has the necessary inverters and buffer if you
use the 555 timer one shot for pulse stretching..

At 09:40 PM 2/7/00 -0600, you wrote:
>Bill,
>
>I have asked about the SV6 here before and basically no one replied. As
>best as I can tell, the SV6 is not directly compatible with the TAC software
>because the SV6 puts out TAIP (Trimble ASCII Interface Protocol) and not the
>NMEA statements the software needs. You need to check closely on what model
>SV6 you have since some of them can be put into the NMEA mode while others
>cannot.
>
>On the other hand, the 1 pps output of the SV-6 will drive the TAC hardware
>fine. It is a 400uS negative going pulse so the inverter section is needed.
>Sorry, but I have not looked at the RX/TX lines yet to see what they need.
>
>Also you need to be aware that at least all of the SV-6 units that I have
>put my hands on in the surplus market are not WNRO compatible. Everything
>will work fine, but the date will be one Unix epoch too high so the date and
>year will read something in the 2100 range.
>
>As for Trimble data, it is hard to find, but here is some I have managed to
>"ferret out":
>
>ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6_5_10.pdf = Press release about
>week rollover compatibility
>ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6_5_12.pdf = Press release about
>week rollover compatibility
>ftp://ftp.trimble.com/pub/y2kwnro/pdf/sv6pre5_04.pdf = Press release about
>week rollover compatibility
>
>ftp://ftp.trimble.com/pub/tracking/pla400-TAIP-Reference.pdf = TAIP
>reference manual
>ftp://ftp.trimble.com/pub/tracking/pla400-Inst&OpsManual.pdf = Placer 400
>info, uses SV-6 engine
>ftp://ftp.trimble.com/pub/tracking/pla400-GPS-StarterKit.exe = Useful
>software
>
>http://www.trimble.com/products/pdf/svee8p.pdf = Product data sheet for the
>SVee8, quite similar to the SV6
>
>I have a copy of some of the old software that came with the SV6, but really
>it wouldn't do you much good. The above references will be the most help,
>particularly the GPS-StarterKit.
>
>Good luck and stay in touch -- apparently there are only a couple of us that
>think the $40-70 new surplus price for the SV6 is a good buy.
>
>Ron
>KC5ODM
>
>
>
>---
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---
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26. [tacgps] RE: Software for extract the date from the gps time.

From: "Daniel J. Bernal" <dabernal@cantv.net>
Date: Tue, 8 Feb 2000 11:33:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65028-2000.02.08-09.31.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hola Francisco:

Has probado la secuencia NMEA $GPRMC y $GPGGA. Ellas dos tienen la fecha y la hora.

Daniel Bernal

daniel@bernal.com

-----Mensaje original-----
De: Francisco Jose Millan Benayas <francisco.millan@datatronics.es>
Para: TAPR Special Interest Group <tacgps@lists.tapr.org>
Fecha: Martes, 08 de Febrero de 2000 08:17 a.m.
Asunto: [tacgps] Software for extract the date from the gps time.

Hi all,
I would like to know if there exists some software to extract the actual date from the gps time and the counter of weeks. If there is no software, anyone knows abot the algorithms to work out the date from the gps time and the counter of weeks.
Thanks.
Francisco.

****
Francisco Jose Millan Benayas

DATATRONICS, S.A. Dep. I+D
Tlf: 34-913 86 38 38 Fax: 34-913 73 26 46
e-mail: francisco.millan@datatronics.es
****

27. [tacgps] RE: Software for extract the date from the gps time.

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 8 Feb 2000 09:49:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65034-2000.02.08-10.42.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Si, si, si, pero no se trata de eso. Perhaps the following code pieces which solve the inverse problem: year, month, day, hour -> gps_time will explain how gps_time is constructed. These are written for MatLab but maybe the logic is clear [floor() rounds down, and rem() takes the remainder]. An important constant is the Julian day that is gps_time = 0. This is in the gps_time function.

Brooks

```
function jd = julday(y,m,d,h)
% JULDAY  Conversion of date as given by
%         y ... year (four digits)
%         m ... month
%         d ... day
%         h ... hour and fraction hereof
%         The conversion is only valid in the time span
%         from March 1900 to February 2100
% See  Hofmann-Wellenhof et al., p. 41--42
%Copyright (c) by Kai Borre

if m <= 2
   y = y-1;
   m = m+12;
end
jd = floor(365.25*y)+floor(30.6001*(m+1))+d+h/24+1720981.5;
% mjd = jd-2400000.5;
%%%%%%% end julday.m  %%%%%%%%%%%%

function [week,sec_of_week] = gps_time(julday)
%GPS_TIME  Conversion of Julian Day number to GPS week and
%           Seconds of Week reckoned from Saturday midnight
%Copyright (c) by Kai Borre

a = floor(julday+.5);
b = a+1537;
c = floor((b-122.1)/365.25);
e = floor(365.25*c);
f = floor((b-e)/30.6001);
d = b-e-floor(30.6001*f)+rem(julday+.5,1);
day_of_week = rem(floor(julday+.5),7);
week = floor((julday-2444244.5)/7);
%We add +1 as the GPS week starts at Saturday midnight
sec_of_week = (rem(d,1)+day_of_week+1)*86400;
%%%%%%% end gps_time.m  %%%%%%%%%%%%

function  [day_of_year,hr,min,sec] = doy(year,month,day,hour)
%DOY     Calculation of day number of year.
%        hour is split into hr, min, and sec
%Copyright (c) by Kai Borre
```

```
day_of_year = julday(year,month,day,0)-julday(year,1,1,0)+1;
hr = floor(hour);
min = floor((hour-hr)*60);
sec = ((hour-hr)-min/60)*3600;
%%%%%%% end doy.m  %%%%%%%%%%%%%

>Hola Francisco:
>
>Has probado la secuencia NMEA $GPRMC y $GPGGA. Ellas dos tienen la fecha y
>la hora.
>
>Daniel Bernal
>
>daniel@bernal.com
>    -----Mensaje original-----
>    De: Francisco Jose Millan Benayas <francisco.millan@datatronics.es>
>    Para: TAPR Special Interest Group <tacgps@lists.tapr.org>
>    Fecha: Martes, 08 de Febrero de 2000 08:17 a.m.
>    Asunto: [tacgps] Software for extract the date from the gps time.
>
>
>    Hi all,
>        I would like to know if there exists some software to extract the
>actual date from the gps time and the counter of weeks. If there is no
>software, anyone knows abot the algorithms to work out the date from the
>gps time and the counter of weeks.
>    Thanks.
>    Francisco.

---
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```

28. [tacgps] Re: Windows 2000 & GPS

```
From: "Jim King" <king@sstar.com>
Date: Tue, 8 Feb 2000 11:56:44 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65066-2000.02.08-11.54.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
The parameter is "noserialmice" (not "mouse").  It's still in the Win2000
version of ntdetect.com, so I'd guess that it still works.  Have you tried
adding it your Win2000 boot.ini?

Jim

> My computer that I had Tac32 on, was a NT4.0 machine.  Over the weekend, I
> put Windows 2000 on it.
>
> It has a problem with the mouse and GPS.  The NoSerialMouse switch does
not
> work under Windows2000 in the boot.ini file.
>
> To get around it, I boot the machine with the GPS disconnected, and then
> its OK.
>
> If you boot it with the GPS, it loads the microsoft intellipoint ball
mouse
> drivers and reserves the comm ports.  And the mouse jumps all over the
> screen.
>
> Anybody heard of a work-around for this ?
>
> 2000 gave me another problem, involving the modem, but I was able to fix
> it.  Otherwise, 2000 works.  Can't see much difference between NT and
> 2000.
>
> Ironically, some of the documentation on the CD refers to it, as NT5 !



---
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```

29. [tacgps] Re: Software for extract the date from the gps time.

```
From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Tue, 08 Feb 2000 18:23:43 +0000
```

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR Special Interest Group <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65068-2000.02.08-12.21.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Francisco Jose Millan Benayas wrote:
>
> Hi all,
>   I would like to know if there exists some software to extract the
> actual date from the gps time and the counter of weeks. If there is no
> software, anyone knows abot the algorithms to work out the date from the
> gps time and the counter of weeks.
> Thanks.
> Francisco.

There was a request for the algorithms to convert GPS week to/from
calendar date. I'm attaching a small BASIC program that documents
the algorithms and handles a lot of calendar-related conversions
including GPS day/week, Julian Date, Sidereal time, etc.

The time that the GPS satellite sends is in seconds during week
starting Sunday morning at 00:00:00 GPS time. Each GPS satellite
(as part of the 1500 bit binary data message sent at 50 bits/sec,
i.e. every 30 secs) sends the current difference between GPS time
(Atomic Time, with no leap seconds) and UTC, so nearly all
receivers report UTC time with the leap second correction
applied.

The "guts" of the software below is the subroutine called
CALENDAR. The sample calling program also uses a couple of
formatting routines. This code should be able to run without
modification in QBASIC or GWBASIC.

73, Tom

```
'--------------------------------------------------------------------
'
' Dr Thomas A. Clark, W3IWI          1998
'
'CALENDAR TEST PROGRAM FOLLOWS:
DECLARE FUNCTION TimeConv$ (Fday#)
DECLARE SUB PrintTimes (Fday#, MJD0#, GMST0#, SidRate#, LongDeg#)
DECLARE SUB Calendar (YY%, MM%, DD%, DoY%, DoW%, GPSwk%, MJD0#, GMST0#,
SidRate#)
DEFINT A-Z 'And all the parameters with names ending # are Double Precision

DayOfWeek$ = "SunMonTueWedThuFriSat"
Months$ = "JanFebMarAprMayJunJulAugSepOctNovDec"

'--------------------------------------------------------------------
'Set some parameters for testing:
'I found it easier to declare a date, but you could use these
'INPUT "Pick a year,Month, Day "; YY,MM,DD
'INPUT "Your Longitude (-West, +East) in Deg "; LongDeg#

YY = 98: MM = 1: DD = 2                     'Test Date
LongDeg# = -(76 + 56.1 / 60)                '@ W3IWI QTH

xx: INPUT "Start HH,MM  "; Hour, Min        'Loop back here
'The fraction of the UTC Day for the start of the loop is:
    Dstep# = 10# / 86400#                   '=10 seconds step in loop
    Fday# = (Hour / 24#) + (Min / 1440#) - Dstep#

CLS

'The call to Calendar routine sets up a lot of parameters
CALL Calendar(YY, MM, DD, DoY, DoW, GPSwk, MJD0#, GMST0#, SidRate#)

'Generate Printable Day and month names:
Day$ = MID$(DayOfWeek$, DoW * 3 + 1, 3)
Month$ = MID$(Months$, MM * 3 - 2, 3)

'Format printout:
PRINT USING "## & #### = & = MJD###### = GPS week####"; DD; Month$; YY;
Day$; MJD0#; GPSwk

    FOR N = 1 TO 22         'since 22 lines fits the screen
    CALL PrintTimes(Fday#, MJD0#, GMST0#, SidRate#, LongDeg#)
```

```
    Fday# = Fday# + Dstep#
    NEXT N
    GOTO xx


END  '------------------ END TEST PROGRAM. Routines follow:
----------------



SUB Calendar (YY, MM, DD, DoY, DoW, GPSwk, MJD0#, GMST0#, SidRate#)

'This routine should be called on startup or at 00:00 UTC to establish some
'calendar parameters. On entry we need the current Year=YY, Month=MM and
'Day=DD. YY can be a 2-digit number [00-99], in which case we solve the Y2K
'problem and set it to be the 4-digit value [1990-2089]. Note that the
Leap-
'Year conversion we use here makes this routine only be valid for dates in
'the range [1901-2099]. (Normally a century Year is not a leap year, but
'the year 2000 is, since the year=2000 is evenly divisible by 400.)
'    Caveat Emptor: If you try to use this before 1901 or after 2100,
'                   try to sue me!

'First, solve the Y2K problem and make a 4-digit year:
   IF YY < 90 THEN YY = YY + 2000             '2000-2089
   IF YY < 100 THEN YY = YY + 1900            '1990-1999

' The following cute line of code gives the elapsed day of year
'     Thirty days hath Septober, April June and NoWonder ...
'           (don't ask questions -- it works like magic!)
   DoY = DD + INT((MM - 2) * 30.58 + 29)

'The following MM<3 correction fixes this cute equation in Jan & Feb
'and the MM>=3 branch fixes Leap years (valid for YY = 1901 thru 2099)
   IF MM < 3 THEN
           DoY = DoY + 2
        ELSE
           IF (YY MOD 4 = 0) THEN DoY = DoY + 1
        END IF

'Form integer part of the Modified Julian Day MJD0 = JD-2400000.5
'This is the MJD at 00:00 UTC
   MJD0# = 15384# + INT((YY - 1901) * 365.25#) + DoY

'And calculate the GPS week and day-of-the-week
   GPSwk = (INT((MJD0# - 4) / 7#) - 176) MOD 1024 'started Jan 6, 1980
   DoW = (MJD0# - 4) MOD 7                        'DoW = [0-6] for
[Sun-Sat]


'Follow the Ephemeris recipe to get GMST at 00:00 UTC in fractions of a day
' and the Sidereal Time Rate based on J2000 IAU definitions, using only
' the principal terms, with constants derived from the ephemeris values:

'Tu# is the yy/mm/dd epoch measured in centuries from J2000 (Jan 0.5 2000)
   Tu# = (MJD0# - 51544.5#) / 36525#

'Sidereal time at 00:00 UTC in fractions of a day, omitting a small cubic
term:
   GMST0# = .2790572732638889#
   GMST0# = GMST0# + (100.0021390378009# + 1.07759259259259D-06 * Tu#) *
Tu#
   GMST0# = GMST0# - INT(GMST0#):    'keep only the fractional part

'And the current sidereal time rate is (omitting a small quadratic term in
Tu):
   SidRate# = 1.002737909350795# + .000000000059006# * Tu#

END SUB  '------------------------------------------------------------------



SUB PrintTimes (Fday#, MJD0#, GMST0#, SidRate#, LongDeg#)
'This Demonstrates the time conversions.
'  Assume that the current UTC is given by Fday, defined by Hour,Min & Sec.
'  MJD0#,GMST0# and SidRate# are calculated by the Calendar routine.
'  LongDeg is your Longitude (+East, -West from GPS)

'The fraction of the UTC Day is given by
```

```
'   fday# = (Hour / 24#) + (min / 1440#) + (sec# / 86400#)

'The current Modified Julian Day is
    MJD# = MJD0# + Fday#

'The Current Greenwich Mean Siderial Time in fractions of a day is
    GMST# = GMST0# + Fday# * SidRate#

'And the Local Mean Sidereal Time is
    LMST# = GMST# + LongDeg# / 360#

PRINT USING "  & UTC = MJD######.##### = & GMST = & LMST";
TimeConv$(Fday#); MJD#; TimeConv$(GMST#); TimeConv$(LMST#)


END SUB
'--------------------------------------------------------------------

FUNCTION TimeConv$ (Fday#)

'First, separate the HH:MM:SS parts

x# = Fday# + 1000#         'Add Constant to insure it is positive
x# = x# + (.0005# / 86400#) 'Add .5 msec to insure proper rounding
x# = x# - INT(x#)

IH = INT(x# * 24)       'HH
x# = x# - (IH / 24#)

IM = INT(x# * 1440#)    'MM
x# = x# - (IM / 1440#)

x# = x# * 86400#        'SS.SS

'In the following, adding 1000 pads the string to include leading zeroes.
'We then trim off the spurious leading characters and combine
th$ = RIGHT$(LTRIM$(STR$(1000 + IH)), 2)
tm$ = RIGHT$(LTRIM$(STR$(1000 + IM)), 2)
ts$ = MID$(LTRIM$(STR$(x# + 1000)), 3, 6)
TimeConv$ = th$ + ":" + tm$ + ":" + ts$

END FUNCTION
'------------------------------------------------------------

---
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```

30. [tacgps] Re: Software for extract the date from the gps time.

From: tvb@veritas.com (Tom Van Baak)
Date: Tue, 8 Feb 2000 16:04:48 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65089-2000.02.08-18.03.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
> Francisco Jose Millan Benayas wrote:
>
> Hi all,
>     I would like to know if there exists some software to extract the
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> Thanks.
> Francisco.

This is a little tricky. If I understand correctly you want to
go from GPS time to calendar date rather than the more common
case (like TAC's QBASIC code) where you go from calendar date
to GPS time.

To keep it simple there are two steps:
1. Convert GPS week/seconds to MJD (Modified Julian Day).
   - knowing that GPS time began 0h 6-Jan-1980
   - guessing the GPS cycle (rollover every 1024 weeks)
   - ignoring the subtile effect of leap seconds
2. Convert MJD to calendar date.

I wrote a tool that implements this using three functions:
GpsToMjd(), DateToMjd(), MjdToDate(). The C source code is:
```

```
  http://www.leapsecond.com/tools/gpsdate.c

If you want to run the tool (Win32) try:
  http://www.leapsecond.com/tools/gpsdate.exe

Here are some examples:

C:\> gpsdate 1999 12 31   ... what MJD was New Years Eve?
1999-12-31 = Mjd 51543

C:\> gpsdate 24 0   ... what date(s) is GPS week 24?
Gps Cycle 0, Week 24, Seconds 0  = Mjd 44412 = 1980-06-22
Gps Cycle 1, Week 24, Seconds 0  = Mjd 51580 = 2000-02-06
Gps Cycle 2, Week 24, Seconds 0  = Mjd 58748 = 2019-09-22

C:\> gpsdate 1023 604799   ... when are the GPS week rollover(s)?
Gps Cycle 0, Week 1023, Seconds 604799  = Mjd 51411 = 1999-08-21
Gps Cycle 1, Week 1023, Seconds 604799  = Mjd 58579 = 2019-04-06
Gps Cycle 2, Week 1023, Seconds 604799  = Mjd 65747 = 2038-11-20

C:\> gpsdate 99999   ... when is the last 5-digit MJD?
Mjd 99999 = 2132-08-31

C:\> gpsdate 51582   ... what day is MJD 51582?
Mjd 51582 = 2000-02-08

/tvb

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

31. [tacgps] Re: GPS Timing Accuracy Comments

From: Russ Chadwick <kb0tvj@bouldernews.infi.net>
Date: Tue, 08 Feb 2000 20:46:17 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65119-2000.02.08-21.44.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
"Dr Thomas A Clark (W3IWI)" wrote:

>
> Personally, I recommend that anyone who is going to try to understand
> time/frequency performance of clocks should become familiar withh
> the Allan Variance. I have my "consensus" version of the AVAR
> showing most standard frequency standards posted at URL
> ftp://tac.gsfc.nasa.gov/pub/avar.gif.
>

My browser (Netscape) could not find  pub/avar.gif  at this location.

Russ


---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

32. [tacgps] Re: GPS Timing Accuracy Comments

From: "Roger Rehr" <rrehr@epix.net>
Date: Tue, 8 Feb 2000 23:11:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65123-2000.02.08-22.08.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
>
> My browser (Netscape) could not find  pub/avar.gif  at this location.
>
> Russ
>
>


Here's the link:

 ftp://tac.gsfc.nasa.gov/avar.pdf
73 from
Roger Rehr  W3SZ ex-AA3QK ex-WA3JYM
mailto:rrehr@epix.net        FN20ah
```

http://www.epix.net/~rrehr
2 Merrymount Road, Reading, PA 19609
610.670.8687
 >

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: GPS Timing Accuracy Comments

From: "Roger Rehr" <rrehr@epix.net>
Date: Tue, 8 Feb 2000 23:31:31 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65125-2000.02.08-22.29.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Oh, Sorry!

I should have mentioned: if your browser won't take you there in one step,
then do:

ftp://tac.gsfc.nasa.gov/

and THEN click on

avar.pdf

If you need Adobe Reader, go to: http://www.adobe.com

73 from
Roger Rehr W3SZ ex-AA3QK ex-WA3JYM
mailto:rrehr@epix.net   FN20ah
http://www.epix.net/~rrehr
2 Merrymount Road, Reading, PA 19609
610.670.8687

>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

34. [tacgps] Re: GPS Timing Accuracy Comments

From: clark@tomcat.gsfc.nasa.gov
Date: Wed, 09 Feb 100 04:40:31 UTC
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: tacgps@lists.tapr.org
Message-ID: <LYR6754-65127-2000.02.08-22.38.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

try the file avar.pdf -- I made I typing error

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

35. [tacgps] GPS interface board

From: "Richard Ames" <richard@linsup.com>
Date: Thu, 10 Feb 2000 22:39:29 +1100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65287-2000.02.10-05.37.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi - Asking for a bit of help.

I purchased the Garmin 25 and the interface board. Attached the two and it
works perfectly, output to a computer terminal is as expected.

Purchased parts for 1 PPS section of circuit - except could not get 74ACD4
so have substituted a 74HC04N.

GPS still working but no 1 PPS from the LED.

Questions - Is the IC substitution OK? Is there a schematic for the board
somewhere?

Thanks for any pointers,

Richard.

Richard Ames
linsup.com, Sydney, Australia
Tel: +61 2 9144-6131
mailto:richard@linsup.com http://www.linsup.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

36. [tacgps] RE: GPS interface board

From: "Richard Ames" <richard@linsup.com>
Date: Thu, 10 Feb 2000 22:52:48 +1100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65288-2000.02.10-05.50.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Blush - Telling the Garmin to send the 1 PPS pulse with the
'$PGRMC,,,,,,,,,,,2' command fixed my problem.

Why does one have to ask for help before RTFMing?

Richard

Richard Ames
linsup.com, Sydney, Australia
Tel: +61 2 9144-6131
mailto:richard@linsup.com http://www.linsup.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] RE: GPS interface board

From: "Steven R. Bible" <n7hpr@amsat.org>
Date: Thu, 10 Feb 2000 09:17:30 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65291-2000.02.10-08.15.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Don't worry Richard, we've all done it at least once (and I do mean once
:-).

- Steve, N7HPR

> -----Original Message-----
> From: bounce-tacgps-5687@lists.tapr.org
> [mailto:bounce-tacgps-5687@lists.tapr.org]On Behalf Of Richard Ames
> Sent: Thursday, February 10, 2000 6:53 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: GPS interface board
>
>
>
> Blush - Telling the Garmin to send the 1 PPS pulse with the
> '$PGRMC,,,,,,,,,,,2' command fixed my problem.
>
> Why does one have to ask for help before RTFMing?
>
> Richard
>
> Richard Ames
> linsup.com, Sydney, Australia
> Tel: +61 2 9144-6131
> mailto:richard@linsup.com http://www.linsup.com
>
>
>
> ---

> You are currently subscribed to tacgps as: SRBIBLE@GATE.NET
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>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

38. [tacgps] Re: GPS interface board

From: Dan Hinz <dan.hinz@ieee.org>
Date: Sun, 13 Feb 2000 10:18:17 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65773-2000.02.13-12.16.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm using the GPS-25 too. I had the same problem. you have to "turn
on" the 1 PPS output. You issue the command (I'll see if I can find
the command) then you have to turn the receiver off and back on. You'll
have the 1 PPS once it achieves a fix after the restart. Also note that
once you have the 1PPS, it stays on even if you lose lock on the
satellites (no failure indication)

73,
Dan, W6LSN

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

39. [tacgps] Re: GPS interface board

From: Tom Cox <tom@cox.org>
Date: Sun, 13 Feb 2000 17:08:17 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-65800-2000.02.13-17.06.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dan, W6LSN wrote:

>.........note that
>once you have the 1PPS, it stays on even if you lose lock on the
>satellites (no failure indication)

Yes, the 1PPS continues, but I believe that there IS a failure
indication. It is the second parameter in the $GPRMC sentence, which
is either "A" (for valid position) or "V" (otherwise). It appears
that when the "V" is reported, the receiver is supplying the 1PPS
based on its own internal oscillator.

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40. [tacgps] TAC32-Windows 2000

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Tue, 15 Feb 2000 22:47:2
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-66229-2000.02.15-22.45.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

FYI.....

Brian,
Unfortunately, that switch is no longer available in Windows 2000.
Paul

(Paul is from Microsoft)
-----Original Message-----
From: Kirby, Brian [mailto:Brian.Kirby@MSFC.NASA.GOV]
Sent: Monday, February 07, 2000 1:07 PM
Subject: Windows 2000 & No Serial Mice

I was running NT4.0 and some GPS hardware hooked up to both comm ports. I
had to add a switch "NoSerialMice" to the boot.ini file, as the GPS data

looks simular to the Microsoft Intellipoint Ball Mouse. If you don't have this switch loaded, the OS loads mouse drivers and assigns the to the comm ports (never mind you have a PS2 mouse). It makes your mouse pointer go crazy, if this switch is not loaded.

I updated to Windows 2000 this weekend, and I have this problem now. The switch is in boot.ini. But, it still making the mouse go haywire. To get around it, I boot the machine without the GPS hardware hooked to it.
Then,
I can hook it back p and everything is OK.

Am I'm doing something wrong, or did Microsoft not allow for this boot switch in Windows 2000 ?

Thanks - Brian

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

41. [tacgps] Garmin - Carrier Phase From a 12XL ?

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Wed, 16 Feb 2000 2:4:3
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-66248-2000.02.16-02.02.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

from: http://www.mts.net/geo/askgeo.htm#gringo

Is it possible to collect and post-process raw satellite measurements collected by a Garmin ?

GRINGO (GPS RINEX Generator) is a program which records the raw receiver measurements (pseudoranges and, optionally, carrier phase measurements) from 12-channel Garmin GPS receivers in RINEX format. It was developed using a Garmin GPS 12XL (software version 2.01), and has since been found to work in the same manner with other Garmin models and software versions. It is likely that it will work in the same way with most models using the same 12-channel engine.

What can you do with GRINGO?

The output from GRINGO is a properly formatted RINEX file, containing the decoded data. This file is created in real-time, from data transmitted from the GPS receiver's data port to a serial port on your computer. With the appropriate processing software, a RINEX pseudorange data file can be combined with data files from other receivers, to measure the vector between the receivers to a higher accuracy than would be possible using the stand-alone coordinates of the two receivers. Depending on the precision of the pseudoranges and the distance between the receivers, relative positioning accuracies of the order of 10 m or better can be achieved (The authors of GRINGO do not guarantee any level of precision for the decoded data, as many factors can influence the performance of a GPS receiver). The latest version (1.2.4) of GRINGO can now output the receiver's carrier phase measurements in addition to the pseudoranges. Unfortunately the carrier phase is truncated to the nearest whole cycle, but since a single cycle is approximately 20 cm, even this low resolution measurement is good to 10 cm. With sufficient epochs of data, these carrier phase measurements can often lead to centimetre-level coordinate accuracies over short baselines.

For more information, contact Art at Prairie Geomatics Ltd

==========
is this for real ? I did not think you could get carrier phase data from a 12XL....

Brian

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

42. [tacgps] RE: tacgps digest: February 15, 2000

From: "Garlock, Ken" <k-garlock@ti.com>
Date: Wed, 16 Feb 2000 08:22:57 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-66271-2000.02.16-08.21.07--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

I find this interesting. I too had the "wild mouse" problem with W2K RTM
120 day evaluation copy. I can find nothing in the M/S knowledge base
regarding the demise of the no serial mice switch. A 3rd party reference
manual, covering both NT4 and W2K, recommended using "/NOSERIALMICE"(note
all caps.) I tried that option and it works for me. Tac32 is purring along
doing its thing, and W2K is happy too. The real proof is whether it is a
reproducible fix with a fresh install of the purchased(now on order) W2K
professional -- let you know when I get my copy.

 It would be good to know the M/S incident number which states the demise of
this switch :-)

73 & Regards,
Ken Garlock, K8CHO   k-garlock@ti.com
My comments, not my employer, Texas Instruments Inc.
TI, THE world leader in Analog & DSP technology.

> -----Original Message-----
> From: TAPR Special Interest Group digest
> [mailto:tacgps@lists.tapr.org]
> Sent: Wednesday, February 16, 2000 12:01 AM
> To: tacgps digest recipients
> Subject: tacgps digest: February 15, 2000
>
>
> TAPR Special Interest Group Digest for Tuesday, February 15, 2000.
>
> 1. TAC32-Windows 2000
>
> ---
>
> Subject: TAC32-Windows 2000
> From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
> Date: Tue, 15 Feb 2000 22:47:2
> X-Message-Number: 1
>
> FYI.....
>
> Brian,
> Unfortunately, that switch is no longer available in Windows 2000.
> Paul
>
> (Paul is from Microsoft)
> -----Original Message-----
> From: Kirby, Brian [mailto:Brian.Kirby@MSFC.NASA.GOV]
> Sent: Monday, February 07, 2000 1:07 PM
> Subject: Windows 2000 & No Serial Mice
>
> I was running NT4.0 and some GPS hardware hooked up to both
> comm ports. I
> had to add a switch "NoSerialMice" to the boot.ini file, as
> the GPS data
> looks simular to the Microsoft Intellipoint Ball Mouse. If
> you don't have
> this switch loaded, the OS loads mouse drivers and assigns
> the to the comm
> ports (never mind you have a PS2 mouse). It makes your mouse
> pointer go
> crazy, if this switch is not loaded.
>
> I updated to Windows 2000 this weekend, and I have this
> problem now. The
> switch is in boot.ini. But, it still making the mouse go
> haywire. To get
> around it, I boot the machine without the GPS hardware hooked to it.
> Then,
> I can hook it back p and everything is OK.
>
> Am I'm doing something wrong, or did Microsoft not allow for this boot
> switch in Windows 2000 ?
>
> Thanks - Brian
>
>
>
> ---

>
> END OF DIGEST
>
> ---
> You are currently subscribed to tacgps as: K-GARLOCK@TI.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

43. [tacgps] Re: Garmin - Carrier Phase From a 12XL ?

From: "Don Robinson" <don.robinson@clear.net.nz>
Date: Thu, 17 Feb 2000 09:43:03 +1300
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-66304-2000.02.16-14.39.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian (and any others),

If you look on:

www.nottingham.ac.uk/iessg/gringo

or therabouts you will find quite a lot of information.

It looks very interesting to me and I am trying the program out
today - using RINEX corrections from a local base station. I will
need to buy the software to take advantage of the Carrier phase
correction tho and also to get more than 60 seconds data.

Now I need to know if there is a command in the Garmin 12XL (via the
port) to store a Waypoint at the current lat lon position.

Don Robinson

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44. [tacgps] Rinex

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Sat, 19 Feb 2000 5:27:36
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-66643-2000.02.19-05.25.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has anybody found a program thats free or cheap, to convert the Oncores
data ?

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

45. [tacgps] Re: Rinex

From: Jeff <barnie@flash.net>
Date: Tue, 22 Feb 2000 07:31:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67223-2000.02.22-08.29.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have been searching for this also. It appears to only exist as
a utility within postprocessing software, which certainly is not cheap.
The lowest cost I have found is $2500.

If you find anything please post it as I think several people would be interested.
I am in the process of writing one myself but it is slow going.

Jeff Vollin

Brian Kirby wrote:

> Has anybody found a program thats free or cheap, to convert the Oncores
> data ?
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET

> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

46. [tacgps] Re: Rinex for the Oncores

From: Dan Charrois <dan@syz.com>
Date: Wed, 23 Feb 2000 01:54:36 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67492-2000.02.23-02.54.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I have been searching for this also. It appears to only exist as
>a utility within postprocessing software, which certainly is not cheap.
>The lowest cost I have found is $2500.
>
>If you find anything please post it as I think several people would be
>interested.
>I am in the process of writing one myself but it is slow going.
>
>Jeff Vollin
>
>
>Brian Kirby wrote:
>
>> Has anybody found a program thats free or cheap, to convert the Oncores
>> data ?

Hi there.

I have a couple of Oncore VPs that I've used successfully for post-processing, using the GeoGenius software package (the license to use this software for relatively simple post-processing is free, though a license for more complicated and accurate position is required). In any case, the software doesn't support the Oncores directly, but needed a Rinex file to work off of.

So I wrote a very quick and dirty utility to convert the Oncore data to Rinex format, and it seems to work just fine for my purposes. There are, however, two problems with it.

1. The Oncore data for carrier phase seems to want to return the phase difference between the received satellite signal and that received from the local oscillator, which is itself offset from L1 so that the differences are always positive even when doppler shifts are considered. However, GeoGenius requires "absolute" carrier phase measurements, or at least measurements of "true" carrier phase changes from one reading to the next, not difference measurements between CP and the local oscillator which drifts around a bit itself. I've tried playing around with determining the internal oscillator's exact frequency from epoch to epoch by using some of the Oncore extended messages, time differences between samples, etc., but have been unable to come up with satisfactory results (ie: the carrier phase processed data I've created in test runs hasn't produced results any better than non-carrier phase processed data). Fortunately, GeoGenius can do reasonable postprocessing using pseudoranges, and the internal smoothing algorithms using CP with the Oncore help make them a bit more accurate. I've been able to get 1-2 metre kinematic accuracy using post processing with pseudoranges, but it would be wonderful to get down to cm. level with static positioning if I could get the carrier phase parts to work. If anyone has any suggestions for this, I'm all ears!!

2. The most significant problem, however, in posting an "Oncore -> Rinex" converter is that my software was meant to post process data collected with the Oncore VP and logged with Cassiopeia E-11 PDAs. The data acquisition software I wrote requested various "raw data" messages from the Oncore, but only stored the information required for post processing in specialized binary files to minimize the storage space required per reading. The converter I wrote converted data in these binary files into Rinex to feed to GeoGenius, but the binary files themselves aren't complete Oncore message packets. Instead, the PDA collection software filters the complete packets down into this "intermediate" form which is then converted to Rinex.

So the bottom line is that unless someone had an identical hardware/software setup to what I used, my converter wouldn't help them any. But I'd be more than happy to answer any questions I can for someone

looking at doing something similar. And if anyone has any ideas on how to
determine "real" carrier phase data from the Oncore messages, let me know!
:-)

Dan

--
Syzygy Research & Technology Ltd. |email: sales@syz.com, support@syz.com
Box 83 | images@syz.com, townnet@syz.com
Legal, AB, T0G 1L0, CANADA |- Creators of "The Digital Universe"
Phone: (780) 961-2213 |- home of "The Astronomical Image Library"
WWW: http://www.syz.com/ | & "The Alberta Town & Business Network"

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

47. [tacgps] Mavin GPS 1pps output?

From: Jon Iza <iapizloj@bi.ehu.es>
Date: Fri, 25 Feb 2000 07:48:11 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67907-2000.02.25-00.44.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Folks,
I've tried to find a tap point for 1pps output on the Mavin GPS. Recently
I've
read some other GPS need a "trigger sentence", such as Garmin $PGRMC.
Someone has find such magic word?
Be well
jon, ea2sn

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

48. [tacgps] Re: Mavin GPS 1pps output?

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 27 Feb 2000 04:40:03 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68207-2000.02.26-22.38.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jon Iza wrote:
>
> Folks,
> I've tried to find a tap point for 1pps output on the Mavin GPS. Recently
> I've
> read some other GPS need a "trigger sentence", such as Garmin $PGRMC.
> Someone has find such magic word?

For Info -- the NMEA protocol allows for manufacturers to have
6-character private, vendor specific messages/commands that begin
with $Pxxxy (P for proprietary) followed by 3 letters for
manufacturer's ID (GRM=Garmin, ASH=Ashtech, MOT=Motorola etcetera)
followed by a command letter of the manufacturer's chosing.

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

49. [tacgps] Phase comparison

From: "Ron L. Sparks" <spark51@attglobal.net>
Date: Sun, 27 Feb 2000 20:16:50 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68331-2000.02.27-20.16.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a question about the "back side" of clock accuracy. I am trying to
design a phase comparator to check an unknown oscillator against my stable
source clock (Forget for a moment what it actually is, just realize it puts
out a 10 MHz sine wave of +/- 1 VPP).

The approach I was looking at was to use a comparator of some type to

digitize the input signals (unknown - unk, and reference - ref). Then take
the output of a 100 MHz TCXO and phase lock it to the reference. I would
then use it's count to give a measure of the time from the start of ref to
the start of unk.

When I started thinking about it, I could not see a way to maintain accuracy
at the levels the ref signal is at (10e-10 or better). I began to see
potential for error to creep in with the accuracy of the front end
comparators, their drift, jitter on the counting oscillator, noise on the
unk signal, etc.

Then I tried to think of a way to do it by hetrodyning the two analog
signals and got to the same problem with amplitude variance issues on the
signals.

My question:

How do you accurately (10e-10 or better) compare two signals once you have
the stable clocks?

Just a side note, I currently have a Rb clock which I guess is 10e-9 or so.
But I also have two non-working HP Cesium beam clocks that I am "part
swapping" and hope to have one working unit soon. It is specified as a
controlling standard and that puts it about 10e-12 or so.

Thanks for any advice,

Ron
KC5ODM

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

50. [tacgps] Re: Phase comparison

From: Tom Van Baak <tvb@veritas.com>
Date: Mon, 28 Feb 2000 15:05:33 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68486-2000.02.28-17.07.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Ron L. Sparks wrote:
...
> How do you accurately (10e-10 or better) compare two signals once you have
> the stable clocks?
...

It all depends on how quickly you want to perform the
phase comparison and over what time domain you want to
make the measurement.

If you're in no real hurry and just interested in mid-
to long-term rate you can get by with just a 2 channel
oscilloscope and watch the zero crossings move relative
to each other. For example if it takes an hour for two
5 MHz signals to move one period (200 ns) then the
relative error is 200 ns / 3600 s = 5.5e-11.

/tvb

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51. [tacgps] RE: Phase comparison

From: "Ron L. Sparks" <spark51@attglobal.net>
Date: Mon, 28 Feb 2000 22:03:34 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68508-2000.02.28-22.02.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>It all depends on how quickly you want to perform the
>phase comparison and over what time domain you want to
>make the measurement.

The oscilloscope method will work fine for most of the things I want to do.

Thanks to all who suggested it. I do have to admit, it gave me a "slap the
head -- duh" moment though <grin>.

On the other hand, it would be fun/nice to have a unit that continuously
monitors the phase difference in a digital fashion so that I can use a PIC
in a data logger function for very long term comparisons (say a week or a
month).

Is there a simple way to do that?

Using the oscilloscope idea makes me wonder about using some form of passive
summing network and then watching the output with an A/D converter chip.
Would that be feasible?

Back to the original idea though, I guess the comparator chip is the only
way I could go if the oscillator signals were different frequencies -- or is
it?

Ron
KC5ODM

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52. [tacgps] Phase comparison & PRS10 Rb w/ Built in GPS locking

From: Brooke Clarke <brooke@pacific.net>
Date: Mon, 28 Feb 2000 23:25:25 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68544-2000.02.29-01.24.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Ron:

This is classically done by making a time interval measurement.
The two signals typically are 1 PPS derived from the standard and unknown.
If you use a microcontroler, like the PIC 16C63, that has an internal timing
capability the x ppm resolution will be determined by the relative values of (a)
1 PPS and (b) the minimum time difference the microcontroler can see. By
slowing down the 1 PPS to 1 PP 10 seconds or 1 PP 100 seconds you can see
smaller values of ppm at the expense of waiting longer for the answer.

One faster approach that I am looking into is the Stanford Research Systems 620
Time interval counter. It can quickly see down to 25 pico seconds in the one
shot mode and finer with averaging. Another method that can be used with the
620 is to measure the time difference between the two 10 MHz signals zero
crossings (the method you wrote about). You can get 1 part in E-11 in a few
seconds.

http://www.srsys.com/html/sr620.html

Note that their new PRS10 Rb source has a built in time tag circuit with 1 nano
second resolution.
This is used either for time tagging or for the built in locking circuit that
locks the PSR10 to a 1 PPS signal like from GPS.

I have just started working with this unit and my web page is under construction
at: http://www.pacific.net/~brooke/PRS10.shtml
and the SRS web page at: http://www.srsys.com/html/prs10.html

73,

Brooke Clarke - N6GCE

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

53. [tacgps] RE: Phase comparison

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 29 Feb 2000 09:18:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-68575-2000.02.29-10.16.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>On the other hand, it would be fun/nice to have a unit that continuously
>monitors the phase difference in a digital fashion so that I can use a PIC

>in a data logger function for very long term comparisons (say a week or a
>month).
>
>Is there a simple way to do that?

If you divide down one of your standard frequencies so it is gives 1 pps
you can just my gps controller board without any modification to do your
phase comparison (QST July '98 & www.rt66.com/~shera). It provides
both a analogue output from its' built in PWM that you monitor on a
voltmeter
and a ASCII serial output of the phase difference for long term recording
(the phase difference is the first of the 3 numbers it prints).

The frequencies you are comparing don't have to be identical, in fact any
frequency that will give an integral number of cycles each second
(after division by 16) will give a stable and correct phase reading.

The accuracy of the phase measurement is about 2-3 nsec for a 30 second
reading (about 1 part in 1e10). If you average for 10 minutes
the accuracy should be about 2e-11, and so on, improving as the sqrt of
the
time of 30-second readings.

If you make the controller just omit the PCM61 DAC which isn't needed in
the
application - you can built then for a little over $50 even using the A&A
PCB and even less if you program your own PIC. How's that for a bargin?

>
>Using the oscilloscope idea makes me wonder about using some form of passive
>summing network and then watching the output with an A/D converter chip.
>Would that be feasible?
>
>Back to the original idea though, I guess the comparator chip is the only
>way I could go if the oscillator signals were different frequencies -- or is
>it?

Brooks

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March 2000

Original source file: tacgps.0003
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0003

1. [tacgps] OCX connectors

From: "Steven R. Bible" <n7hpr@tapr.org>
Date: Sun, 5 Mar 2000 14:51:44 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <rrehr@epix.net>
Message-ID: <LYR6754-69302-2000.03.05-13.50.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
Return-Path: <rrehr@epix.net>
Received: from bean.epix.net ([199.224.64.57]) by lists.tapr.org with
SMTP (Lyris Server version 3.0); Sun, 05 Mar 2000 10:12:13 -0600
Received: from rrehr (lspt-66ppp83.epix.net [199.224.66.83])
        by bean.epix.net (8.9.3/8.9.3/1999100101/PL) with SMTP id LAA26033
        for <tac32@lists.tapr.org>; Sun, 5 Mar 2000 11:13:35 -0500 (EST)
Return-Receipt-To: "Roger Rehr" <rrehr@epix.net>
From: "Roger Rehr" <rrehr@epix.net>
To: <tac32@lists.tapr.org>
Subject: OCX connectors
Date: Sun, 5 Mar 2000 11:13:29 -0500
Message-ID: <000201bf86bd$bfd1c580$0300a8c0@rrehr>
X-Priority: 3 (Normal)
X-MSMail-Priority: Normal
X-Mailer: Microsoft Outlook CWS, Build 9.0.2416 (9.0.2910.0)
X-MimeOLE: Produced By Microsoft MimeOLE V5.00.2314.1300
Importance: Normal

Hello all.

This is a 'newbie' question.  I've just finished the TAC-2 and installed
the
Oncore VP on it.  I find that my Mororola antenna has a BNC connector
and
the Oncore has OCX connectors (I know that this is what they're called
only
because that's what the oncore manual says).  TAPR sells an 'MCX' rf
pigtail
for the Garmin GPS receiver.

Is MCX the same as OCX and will it fit on the Oncore I have?
Where else can I get OCX connectors?
On a Sunday?


Thanks in advance!


73 from
Roger Rehr  W3SZ ex-AA3QK ex-WA3JYM
mailto:rrehr@epix.net        FN20ah
http://www.epix.net/~rrehr
2 Merrymount Road, Reading, PA  19609
610.670.8687



---
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```

2. [tacgps] OOPS; it may actually the ONCORE UT+

From: "Steven R. Bible" <n7hpr@tapr.org>
Date: Sun, 5 Mar 2000 14:52:15 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69303-2000.03.05-13.50.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
Return-Path: <rrehr@epix.net>
Received: from bean.epix.net ([199.224.64.57]) by lists.tapr.org with
SMTP (Lyris Server version 3.0); Sun, 05 Mar 2000 11:12:00 -0600
Received: from rrehr (lspt-66ppp83.epix.net [199.224.66.83])
        by bean.epix.net (8.9.3/8.9.3/1999100101/PL) with SMTP id MAA00940
        for <tac32@lists.tapr.org>; Sun, 5 Mar 2000 12:13:22 -0500 (EST)
Return-Receipt-To: "Roger Rehr" <rrehr@epix.net>
```

From: "Roger Rehr" <rrehr@epix.net>
To: <tac32@lists.tapr.org>
Subject: OOPS; it may actually the ONCORE UT+
Date: Sun, 5 Mar 2000 12:13:20 -0500
Message-ID: <000501bf86c6$1b9ec5e0$0300a8c0@rrehr>
X-Priority: 3 (Normal)
X-MSMail-Priority: Normal
X-Mailer: Microsoft Outlook CWS, Build 9.0.2416 (9.0.2910.0)
X-MimeOLE: Produced By Microsoft MimeOLE V5.00.2314.1300
Importance: Normal

I sent a message a few minutes ago; as below; but I am not actually sure
that the GPS receiver I have is the VP; it could be the is the UT+ I
think.
That is what was ordered.

I got it from TAPR 2 weeks ago, and it looks like the receiver in the
differential GPS pictures at www.tapr.org/tapr/html/gpsf.html which is
called a VP on those pages. It has rectangular metal boxes on top and
bottom. It does not look like the receiver without these boxes which is
shown as an illustration on the UT+ page at also at the tapr website.
Of
course, it also doesn't look exactly like the ONCORE VP pictures shown
on
the ONCORE VP page, also on the tapr website! Im guessing the ONCORE
UT+
picture is incorrect and thats what I have...

My second guess is that all of these have the same antenna connector,
but I
don't know that for sure...my original question was essentially "where
can I
get an antenna connector to hook onto the ONCORE?"

HEREs the original post:

This is a 'newbie' question. I've just finished the TAC-2 and installed
the
Oncore VP on it. I find that my Mororola antenna has a BNC connector
and
the Oncore has OCX connectors (I know that this is what they're called
only
because that's what the oncore manual says). TAPR sells an 'MCX' rf
pigtail
for the Garmin GPS receiver.

Is MCX the same as OCX and will it fit on the Oncore I have?
Where else can I get OCX connectors?
On a Sunday?

Thanks in advance!

73 from
Roger Rehr W3SZ ex-AA3QK ex-WA3JYM
mailto:rrehr@epix.net   FN20ah
http://www.epix.net/~rrehr
2 Merrymount Road, Reading, PA 19609
610.670.8687

The following moderated messages are currently pending:

 * Message 182
 * Subject: Re: [tac32] TAC32 Version 2.2.4 is available

 * Message 223
 * Subject: Re: [tac32] TAC32 Version 2.3.0 is available

 * Message 240
 * Subject: Add DGPS support to WinAPRS?

 * Message 263
 * Subject: Re: [tac32] TAC32 Version 2.4.0 is available

```
 * Message 296
 * Subject: OCX connectors

 * Message 297
 * Subject: OOPS; it may actually the ONCORE UT+


---

To approve these messages, send the following two line message to
lyris@lists.tapr.org

   login (enter your password here)
   moderate approve 182 223 240 263 296 297

---

To reject (delete) these messages, send the following two line message
to
lyris@lists.tapr.org

   login (enter your password here)
   moderate reject 182 223 240 263 296 297




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```

3. [tacgps] Re: OOPS; it may actually the ONCORE UT+

```
From: "Doug McKinney" <Design@mt.to>
Date: Sun, 5 Mar 2000 22:07:26 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69384-2000.03.06-00.05.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

The VP, GT+ and UT+ all have the same antenna connector(MCX/OCX). On my
web page www.mt.to you can see each GPS (VP, GT+ and UT+ pivtured).

Doug

```
----- Original Message -----
From: Steven R. Bible <n7hpr@tapr.org>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Sunday, March 05, 2000 11:52 AM
Subject: [tacgps] OOPS; it may actually the ONCORE UT+


> Return-Path: <rrehr@epix.net>
> Received: from bean.epix.net ([199.224.64.57]) by lists.tapr.org with
> SMTP (Lyris Server version 3.0); Sun, 05 Mar 2000 11:12:00 -0600
> Received: from rrehr (lspt-66ppp83.epix.net [199.224.66.83])
> by bean.epix.net (8.9.3/8.9.3/1999100101/PL) with SMTP id MAA00940
> for <tac32@lists.tapr.org>; Sun, 5 Mar 2000 12:13:22 -0500 (EST)
> Return-Receipt-To: "Roger Rehr" <rrehr@epix.net>
> From: "Roger Rehr" <rrehr@epix.net>
> To: <tac32@lists.tapr.org>
> Subject: OOPS; it may actually the ONCORE UT+
> Date: Sun, 5 Mar 2000 12:13:20 -0500
> Message-ID: <000501bf86c6$1b9ec5e0$0300a8c0@rrehr>
> X-Priority: 3 (Normal)
> X-MSMail-Priority: Normal
> X-Mailer: Microsoft Outlook CWS, Build 9.0.2416 (9.0.2910.0)
> X-MimeOLE: Produced By Microsoft MimeOLE V5.00.2314.1300
> Importance: Normal
>
> I sent a message a few minutes ago; as below; but I am not actually sure
> that the GPS receiver I have is the VP; it could be the is the UT+ I
> think.
> That is what was ordered.
>
> I got it from TAPR 2 weeks ago, and it looks like the receiver in the
> differential GPS pictures at www.tapr.org/tapr/html/gpsf.html which is
> called a VP on those pages.  It has rectangular metal boxes on top and
> bottom.  It does not look like the receiver without these boxes which is
> shown as an illustration on the UT+ page at also at the tapr website.
> Of
```

> course, it also doesn't look exactly like the ONCORE VP pictures shown
> on
> the ONCORE VP page, also on the tapr website! Im guessing the ONCORE
> UT+
> picture is incorrect and thats what I have...
>
> My second guess is that all of these have the same antenna connector,
> but I
> don't know that for sure...my original question was essentially "where
> can I
> get an antenna connector to hook onto the ONCORE?"
>
> HEREs the original post:
>
> This is a 'newbie' question. I've just finished the TAC-2 and installed
> the
> Oncore VP on it. I find that my Mororola antenna has a BNC connector
> and
> the Oncore has OCX connectors (I know that this is what they're called
> only
> because that's what the oncore manual says). TAPR sells an 'MCX' rf
> pigtail
> for the Garmin GPS receiver.
>
> Is MCX the same as OCX and will it fit on the Oncore I have?
> Where else can I get OCX connectors?
> On a Sunday?
>
>
> Thanks in advance!
>
> 73 from
> Roger Rehr W3SZ ex-AA3QK ex-WA3JYM
> mailto:rrehr@epix.net   FN20ah
> http://www.epix.net/~rrehr
> 2 Merrymount Road, Reading, PA 19609
> 610.670.8687
>
>
>
>
> ---
>
> The following moderated messages are currently pending:
>
> * Message 182
> * Subject: Re: [tac32] TAC32 Version 2.2.4 is available
>
> * Message 223
> * Subject: Re: [tac32] TAC32 Version 2.3.0 is available
>
> * Message 240
> * Subject: Add DGPS support to WinAPRS?
>
> * Message 263
> * Subject: Re: [tac32] TAC32 Version 2.4.0 is available
>
> * Message 296
> * Subject: OCX connectors
>
> * Message 297
> * Subject: OOPS; it may actually the ONCORE UT+
>
>
> ---
>
> To approve these messages, send the following two line message to
> lyris@lists.tapr.org
>
>   login (enter your password here)
>   moderate approve 182 223 240 263 296 297
>
> ---
>
> To reject (delete) these messages, send the following two line message
> to
> lyris@lists.tapr.org
>
>   login (enter your password here)

> moderate reject 182 223 240 263 296 297
>
>
>
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] TAPR DGPS board for Oncore

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 6 Mar 2000 7:42:36
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69419-2000.03.06-07.41.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a question on the DGPS I/F board LED. Is the LED in "series" with an open collector driver (+Vcc - LED - collector or logic to ground) or is it "driven" against ground (LED directly feed about 1.7V to ground)? I plan to remote the LED to a front panel of a box, and only want to bring out the minimum in wiring from the GPS, which will be in a box, inside of the main box. Thanks

---
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5. [tacgps] Re: TAPR DGPS board for Oncore

From: "Doug McKinney" <Design@mt.to>
Date: Mon, 6 Mar 2000 15:55:26 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69560-2000.03.06-17.53.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian, it is driven from 5 volt logic through a 220 ohm resistor in series with the LED to ground.

Doug

----- Original Message -----
From: Brian Kirby <brian.kirby@msfc.nasa.gov>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Monday, March 06, 2000 7:42 AM
Subject: [tacgps] TAPR DGPS board for Oncore

> I have a question on the DGPS I/F board LED. Is the LED in "series" with
> an open collector driver (+Vcc - LED - collector or logic to ground) or is
> it "driven" against ground (LED directly feed about 1.7V to ground)? I
> plan to remote the LED to a front panel of a box, and only want to bring
> out the minimum in wiring from the GPS, which will be in a box, inside of
> the main box. Thanks
>
> ---
> You are currently subscribed to tacgps as: KC3RL@MCKTECH.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Binary command list for old Oncore PVT???

From: John Ackermann <jra@febo.com>
Date: Wed, 08 Mar 2000 08:08:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69873-2000.03.08-07.07.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I wonder if anyone on the list might have a list of the binary commands (Motorola format) that the old 6 channel Oncore PVT accepts.

I'm trying to get my old unit running as a time source for ntp under Linux,
and the author of the Oncore module in NTP only has the reference materials
for the newer units. We're trying to figure out what commands the 6 channel
PVT unit will accept.

I have the paper reference manual but was hoping someone here might have
some electronic documentation with that information so I can more easily get
it to Reg Clements, the Oncore ntp driver guy.

Thanks and 73,

John N8UR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: Binary command list for old Oncore PVT???

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 08 Mar 2000 07:23:14 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69875-2000.03.08-07.22.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John Ackermann wrote:
>
> I wonder if anyone on the list might have a list of the binary commands
> (Motorola format) that the old 6 channel Oncore PVT accepts.
>
> I'm trying to get my old unit running as a time source for ntp under Linux,
> and the author of the Oncore module in NTP only has the reference materials
> for the newer units. We're trying to figure out what commands the 6 channel
> PVT unit will accept.
>
> I have the paper reference manual but was hoping someone here might have
> some electronic documentation with that information so I can more easily get
> it to Reg Clements, the Oncore ntp driver guy.

I have the paper, too, but also a pretty good working knowledge of the
commands.

Tell me... or have him tell me... what he wants to send and receive in a
general form and I'll birddog the commands.

73, gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

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8. [tacgps] Re: Binary command list for old Oncore PVT???

From: John Ackermann <jra@febo.com>
Date: Wed, 08 Mar 2000 09:07:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69878-2000.03.08-08.06.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Gerry --

I think the problem is sorting out commands that work in the later units
but aren't supported by the old ones (like my 6 channel PVT with firmware
version 5.0). I'm on the trail using some debug output from ntpd to show
which commands are bombing, and if we're lucky that may be enough.

If not, I may take you up on your offer...

73,
John

In message <LYR5592-69875-2000.03.08-07.22.37--JRA#FEBO.COM@lists.tapr.org>, Ge
rry Creager N5JXS writes:
>John Ackermann wrote:
>>
>> I wonder if anyone on the list might have a list of the binary commands
>> (Motorola format) that the old 6 channel Oncore PVT accepts.
>>
>> I'm trying to get my old unit running as a time source for ntp under Linux,
>> and the author of the Oncore module in NTP only has the reference materials
>> for the newer units. We're trying to figure out what commands the 6 channel
>> PVT unit will accept.
>>
>> I have the paper reference manual but was hoping someone here might have
>> some electronic documentation with that information so I can more easily get
>> it to Reg Clements, the Oncore ntp driver guy.
>
>I have the paper, too, but also a pretty good working knowledge of the
>commands.
>
>Tell me... or have him tell me... what he wants to send and receive in a
>general form and I'll birddog the commands.
>
>73, gerry n5jxs
>--
>Gerry Creager   Spatial Sciences Laboratory
>979.845.7201 Office   Texas Agricultural Experiment Station
>979.845.2273 Fax   Texas A&M University System
>979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
>gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
>"Opinions expressed are mine and do not necessarily represent those of
>Texas A&M University."
>
>---
>You are currently subscribed to tacgps as: JRA@FEBO.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] Re: Binary command list for old Oncore PVT???

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 08 Mar 2000 10:35:06 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69905-2000.03.08-10.34.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John Ackermann wrote:
>
> Hi Gerry --
>
> I think the problem is sorting out commands that work in the later units
> but aren't supported by the old ones (like my 6 channel PVT with firmware
> version 5.0). I'm on the trail using some debug output from ntpd to show
> which commands are bombing, and if we're lucky that may be enough.

OK. Let me know. I've done a fair bit with the 6 and 8 channel units,
both. If I get done with the geodesy presentation today, I'll try to go
thru the manual and excerpt the appropriate timing info and ship it
along. IF I don't do it today, it'll drop back in the queue 'til you or
Rog request it again...

73, gerry
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

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10. [tacgps] Rockwell "Jupiter" GPS? Any good?

From: Phil Reed <pcr@ic.net>
Date: Wed, 08 Mar 2000 18:09:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-69986-2000.03.08-17.09.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In flipping through a recent copy of Nuts and Volts magazine, I came across
an ad from a fellow who's selling a bunch of Rockwell "Jupiter" GPS
receivers for $70 each. Based on the ad, I'd venture to say that they don't
have antennas.

* Miniature 12 channel receiver engine (2.75"x1.5"x.25")
* Compatible with active and passive antennas
* Standard 2mm 2x10 interface connector (??)
* Supports NMEA 0183 and binary protocols

Questions: Anybody got any experience with these? Are they any good for
anything? What "binary" protocol? Could these be used with the TAPR DGPS
station?

...phil / w8sca

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11. [tacgps] Re: Rockwell "Jupiter" GPS? Any good?

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 09 Mar 2000 02:41:58 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70004-2000.03.08-20.40.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Phil Reed wrote:
>
> In flipping through a recent copy of Nuts and Volts magazine, I came across
> an ad from a fellow who's selling a bunch of Rockwell "Jupiter" GPS
> receivers for $70 each. Based on the ad, I'd venture to say that they don't
> have antennas.
>
> * Miniature 12 channel receiver engine (2.75"x1.5"x.25")
> * Compatible with active and passive antennas
> * Standard 2mm 2x10 interface connector (??)
> * Supports NMEA 0183 and binary protocols
>
> Questions: Anybody got any experience with these? Are they any good for
> anything? What "binary" protocol? Could these be used with the TAPR DGPS
> station?
>
> ...phil / w8sca

The Rockwell binary protocol is totally different from the
Motorola ONCORE protocol we have used in the timing and DGPS
activities. Neither my TAC-2 board nor Doug's interface boards
nor the TAPR DGPS interface board is set up to mount the
Jupiter receiver. My TAC can mount an ONCORE or a Garmin or
a Trimble (SK8), and Doug has done the ONCORE and Garmin
interface boards available thru TAPR.

The Jupiter does not GENERATE any type of DGPS correction
signals, so it cannot be used as the base station. I believe
it does accept DGPS signals so it probably will function as
a DGPS "slave".

So you are on your own -- good luck.

73, Tom

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12. [tacgps] Re: Rockwell "Jupiter" GPS? Any good?

From: Phil Reed <pcr@ic.net>
Date: Wed, 08 Mar 2000 21:49:42 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70006-2000.03.08-20.48.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the update. That's the news I needed to hear. I haven't
purchased one yet, waiting to find out if they would be worth the effort.

...phil / w8sca

>
>The Rockwell binary protocol is totally different from the
>Motorola ONCORE protocol we have used in the timing and DGPS
>activities. Neither my TAC-2 board nor Doug's interface boards
>nor the TAPR DGPS interface board is set up to mount the
>Jupiter receiver. My TAC can mount an ONCORE or a Garmin or
>a Trimble (SK8), and Doug has done the ONCORE and Garmin
>interface boards available thru TAPR.
>
>The Jupiter does not GENERATE any type of DGPS correction
>signals, so it cannot be used as the base station. I believe
>it does accept DGPS signals so it probably will function as
>a DGPS "slave".
>
>So you are on your own -- good luck.
>
>73, Tom
>
>---
>You are currently subscribed to tacgps as: PCR@IC.NET
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: Binary command list for old Oncore PVT???

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 09 Mar 2000 02:56:04 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70008-2000.03.08-20.54.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager and John Ackermann opined:

> > I think the problem is sorting out commands that work in the later units
> > but aren't supported by the old ones (like my 6 channel PVT with firmware
> > version 5.0). I'm on the trail using some debug output from ntpd to show
> > which commands are bombing, and if we're lucky that may be enough.
>
> OK. Let me know. I've done a fair bit with the 6 and 8 channel units,
> both. If I get done with the geodesy presentation today, I'll try to go
> thru the manual and excerpt the appropriate timing info and ship it
> along. IF I don't do it today, it'll drop back in the queue 'til you or
> Rog request it again...

A lot depends on just how old is old! Motorola made a MAJOR
software revision at version 5.0. The character of the receiver
changed totally -- like night-to-day -- with that change. There
were a lot of antique version 2.x software PVT-6's dumped
on unsuspecting folks (like at Dayton fleamarket) and very few
folks found them to be very useful. Caveat Emptor.

Rick supports the post-5 releases in TAC32 as does my old
Messdos SHOWTIME controller -- my original TAC developments
were started with 4.x firmware and with a beta release of 5.0
things started to perform well. But that doesn't help with the
emasculated Eunichs problem.

John -- I have some old Ver.5 era manuals around here somewhere
if you really need documentation. The 8-channel commands
(like @@EA) have 6-channel counterparts (like @@BA). The
main difference is in the length of the response string
(in the ratio of ~8:6). But, if the firmware is pre-version
5 I would recommend pasting a DNR cardiac arrest notification
on the antique boards! And no, there is no easy way to
have the old firmware upgraded anymore. Just buy a new UT+.

73, Tom

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14. [tacgps] Re: Binary command list for old Oncore PVT???

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 08 Mar 2000 21:37:24 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70010-2000.03.08-21.36.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>
> John -- I have some old Ver.5 era manuals around here somewhere
> if you really need documentation. The 8-channel commands
> (like @@EA) have 6-channel counterparts (like @@BA). The
> main difference is in the length of the response string
> (in the ratio of ~8:6). But, if the firmware is pre-version
> 5 I would recommend pasting a DNR cardiac arrest notification
> on the antique boards! And no, there is no easy way to
> have the old firmware upgraded anymore. Just buy a new UT+.

As has been my experience over the last, what, Tom? 15 years? Tom is
correct in this regard. The pre-V.5 firmware was pretty grim, and the
best thing the 2.0 firmware PVT-6's were good for was adding $95 to get
them replaced with receivers with newer firmware.

I guess I'd made the gross assumption that the receivers must be V.5...
I don't think the V.2 stuff is still functioning... At least the 2 I
still haven't gotten upgraded, died in August, last.

73, gerry
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
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15. [tacgps] Re: Binary command list for old Oncore PVT???

From: John Ackermann <jra@febo.com>
Date: Thu, 09 Mar 2000 07:30:01 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70068-2000.03.09-06.28.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom --

The software in my PVT is 5.0 (whew!) -- it's actually one of the
original units that Bdale picked up (along with you?) in an early group
purchase.

I think I've put together the information needed to add support to the
ntp driver. In addition to a couple of command differences between 6
and 8 channel units, there are a couple of commands that are defined in
the ntp oncore driver that don't exist in my reference manual, which
seems to cover 6 and early 8 channel units. In particular, the ntp
driver defines commands "Ch" and "Sz" which I don't find in my ref
manual -- but on the other hand, I can't see where those commands are
actually used in the code.

I'll continue to work with Reg Clements, and may be back here to pick
brains as necessary. But I think we've got enough data now to get
started.

John

> Gerry Creager and John Ackermann opined:
>
> > > I think the problem is sorting out commands that work in the later units
> > > but aren't supported by the old ones (like my 6 channel PVT with firmware
> > > version 5.0). I'm on the trail using some debug output from ntpd to show
> > > which commands are bombing, and if we're lucky that may be enough.
> >

> > OK. Let me know. I've done a fair bit with the 6 and 8 channel units,
> > both. If I get done with the geodesy presentation today, I'll try to go
> > thru the manual and excerpt the appropriate timing info and ship it
> > along. IF I don't do it today, it'll drop back in the queue 'til you or
> > Rog request it again...
>
> A lot depends on just how old is old! Motorola made a MAJOR
> software revision at version 5.0. The character of the receiver
> changed totally -- like night-to-day -- with that change. There
> were a lot of antique version 2.x software PVT-6's dumped
> on unsuspecting folks (like at Dayton fleamarket) and very few
> folks found them to be very useful. Caveat Emptor.
>
> Rick supports the post-5 releases in TAC32 as does my old
> Messdos SHOWTIME controller -- my original TAC developments
> were started with 4.x firmware and with a beta release of 5.0
> things started to perform well. But that doesn't help with the
> emasculated Eunichs problem.
>
> John -- I have some old Ver.5 era manuals around here somewhere
> if you really need documentation. The 8-channel commands
> (like @@EA) have 6-channel counterparts (like @@BA). The
> main difference is in the length of the response string
> (in the ratio of ~8:6). But, if the firmware is pre-version
> 5 I would recommend pasting a DNR cardiac arrest notification
> on the antique boards! And no, there is no easy way to
> have the old firmware upgraded anymore. Just buy a new UT+.
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
John Ackermann   N8UR
Dayton, Ohio, USA
jra@febo.com -- http://www.febo.com

-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: 2.6.3a

mQBtAzgI9hgAAAEDAMiMQDZTVVuVIS0AscJ0Wy63oK4+Q5xvtxbX/ZoG1qCOuYDI
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bGnpuTxinuW/gKaI3bt2MC8QZZq0gy2de26907lE2A==
=UHWl
-----END PGP PUBLIC KEY BLOCK-----

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16. [tacgps] TAC32 Reg. PW

From: "LeRoy W. Ellis" <w6qj@thegrid.net>
Date: Thu, 9 Mar 2000 10:14:26
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70093-2000.03.09-10.13.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have not recieved the password for the latest version of TAC32.
Rick thinks I may have been dropped from list for what ever reason.

Would you pleasee check for me.

Thank's

73 / Roy
W6QJ

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] RE: TAC32 Reg. PW

From: "Steven R. Bible" <srbible@dandin.com>
Date: Thu, 9 Mar 2000 11:40:22 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70100-2000.03.09-10.39.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Roy,

I checked the list, you are still subscribed to the TAC32 list. I'll
resend the password in a private email to you.

- Steve, N7HPR

> -----Original Message-----
> From: bounce-tacgps-5687@lists.tapr.org
> [mailto:bounce-tacgps-5687@lists.tapr.org]On Behalf Of LeRoy W. Ellis
> Sent: Thursday, March 09, 2000 10:14 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] TAC32 Reg. PW
>
>
> I have not recieved the password for the latest version of TAC32.
> Rick thinks I may have been dropped from list for what ever reason.
>
> Would you pleasee check for me.
>
> Thank's
>
> 73 / Roy
> W6QJ
>
> ---
> You are currently subscribed to tacgps as: SRBIBLE@GATE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] NMEA mode on startup on Oncore VP

From: Eduardo Jacob <edu@kender.es>
Date: Sun, 12 Mar 2000 23:51:44 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70667-2000.03.12-16.50.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I was willing to have the Oncore VP starting in NMEA mode, and giving only a message. I have tried to see if there is a possibility just taking a look at the TAC32 advanced programming menu, but I don't see how to do it. I remember that before reformating my room for the boys (Now I am on a 3 sq mts cubicle) I had a manual that came with the Oncore, perhaps that should be there?. In any case if anybody has a quick recipe for doing this... I would only need the $GPRMC message. I there is no way to get this, which should be the mininal sentence to send to the unit?. I any case I would like to have a manual of commands of, it, do you now if it is available one the WWW (I thougth I had seen this little time ago...)

Best regards

Eduardo

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] Re: NMEA mode on startup on Oncore VP

From: "Doug McKinney" <Design@mt.to>
Date: Sun, 12 Mar 2000 20:53:43 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70709-2000.03.12-22.54.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Eduardo, I just looked at www.tapr.org, but it appears to be down. If you
get into the site, go to the gps section and look for my download on
"Operating the Motorola GPS Engines in NMEA-0183 Mode". That document

should answer your questions.

Doug
KC3RL

----- Original Message -----
From: Eduardo Jacob <edu@kender.es>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Sunday, March 12, 2000 2:51 PM
Subject: [tacgps] NMEA mode on startup on Oncore VP

> I was willing to have the Oncore VP starting in NMEA mode, and giving only
a message. I have tried to see if there is a possibility just taking a look
at the TAC32 advanced programming menu, but I don't see how to do it. I
remember that before reformating my room for the boys (Now I am on a 3 sq
mts cubicle) I had a manual that came with the Oncore, perhaps that should
be there?. In any case if anybody has a quick recipe for doing this... I
would only need the $GPRMC message. I there is no way to get this, which
should be the mininal sentence to send to the unit?. I any case I would like
to have a manual of commands of, it, do you now if it is available one the
WWW (I thougth I had seen this little time ago...)
>
> Best regards
>
> Eduardo
>
> ---
> You are currently subscribed to tacgps as: KC3RL@MCKTECH.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] Re: NMEA mode on startup on Oncore VP

From: Eduardo Jacob <edu@kender.es>
Date: Tue, 14 Mar 2000 00:06:40 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70858-2000.03.13-17.05.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 20:53 12/03/00 -0800, you wrote:
>Eduardo, I just looked at www.tapr.org, but it appears to be down. If you
>get into the site, go to the gps section and look for my download on
>"Operating the Motorola GPS Engines in NMEA-0183 Mode". That document
>should answer your questions.

        Yes, that has solved problems...

        Thanks

        Eduardo/EA2BAJ

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Post Processing

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Thu, 30 Mar 2000 22:42:0
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74544-2000.03.30-22.41.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anybody have a copy of GrafNav or Jupiter ? This is the only software
I have found that can post process Oncore VP. Anybody found anything else
that can post process the Oncore VP ?

Brian

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 31 Mar 2000 00:30:34 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74567-2000.03.31-00.28.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> Does anybody have a copy of GrafNav or Jupiter ? This is the only software
> I have found that can post process Oncore VP. Anybody found anything else
> that can post process the Oncore VP ?

I'm back on a project that will generate RINEX from OnCore binary. When
I get that done and grafted into some OnCore RTCM code I've just gotten,
I'm going to turn my attention to a reasonable (read, GPL) cost
post-processing program. I've acquired some code from the National
Geodetic Survey, and if you'd like to play with it, I can make it
available. It's Fortran, but it works. Not currently designed for
Linux, and doesn't compile out of the box. No Makefile, mostly
monolithic, you know, FORTRAN.

Advise if interested via e-mail.

73, gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

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23. [tacgps] Re: tacgps digest: March 30, 2000

From: Dan Charrois <dan@syz.com>
Date: Fri, 31 Mar 2000 02:09:42 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74578-2000.03.31-03.18.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:

>Does anybody have a copy of GrafNav or Jupiter ? This is the only software
>I have found that can post process Oncore VP. Anybody found anything else
>that can post process the Oncore VP ?

I've had some success with GeoGenius, which can post process RINEX data,
which I created from Oncore VP data (they have a demo version you can try
out which is actually quite functional). But I have had a few problems in
trying to get it to deal with carrier phase properly, so the solutions I've
gotten from it are at the metre level, not cm level or anything. Still a
lot better than 100m thanks to S/A, etc. :-)

If you work out how to generate carrier phase info properly from Oncore
data, let me know!

I haven't tried GrafNav or Jupiter. Is there a demo version of those
packages available?

Dan

--
Syzygy Research & Technology Ltd. |email: sales@syz.com, support@syz.com
Box 83 | images@syz.com, townnet@syz.com
Legal, AB, T0G 1L0, CANADA |- Creators of "The Digital Universe"
Phone: (780) 961-2213 |- home of "The Astronomical Image Library"
WWW: http://www.syz.com/ | & "The Alberta Town & Business Network"

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24. [tacgps] Re: Post Processing

From: "Ira A. Wilner" <bdcst@sover.net>
Date: Fri, 31 Mar 2000 16:52:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74685-2000.03.31-16.06.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

-----Original Message-----
From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Date: Friday, March 31, 2000 1:28 AM
Subject: [tacgps] Re: Post Processing

>Brian Kirby wrote:
>>
>> Does anybody have a copy of GrafNav or Jupiter ? This is the only
software
>> I have found that can post process Oncore VP. Anybody found anything
else
>> that can post process the Oncore VP ?
>
>I'm back on a project that will generate RINEX from OnCore binary. When
>I get that done and grafted into some OnCore RTCM code I've just gotten,
>I'm going to turn my attention to a reasonable (read, GPL) cost
>post-processing program. I've acquired some code from the National
>Geodetic Survey, and if you'd like to play with it, I can make it
>available

Gerry,

I've got a copy of Omni from NGS, written for DOS environment, which will
do post processing if we can get the VP output into RINEX.   This is
precisely what I await!

--Ira (W1IRA)

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25. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 31 Mar 2000 20:00:31 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74734-2000.03.31-19.58.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Ira A. Wilner" wrote:

> I've got a copy of Omni from NGS, written for DOS environment, which will
> do post processing if we can get the VP output into RINEX.   This is
> precisely what I await!

I've got Omni as well as PAGES (which I use for my long-baseline
processing and geodetic work). They are good example sets. What I have
to do now is snag the appropriately time-tagged carrier phase info so we
know what epochs to assign to what. As Tom points out, the carrier
phase information isn't necessarily associated with the code-phase
time-tagging. What we're going to end up doing is characterizing the
latency statistically for several receivers and assigning an offset
value that we consider characteristic of the receiver architecture.
Unless anyone has a better idea! I'm open!

I also have some code-phase resolution (single difference) code from NGS
that isn't related to Omni or PAGES... That's what I'm probably going to
concentrate on for point-position resolution for this round.

73, gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
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979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
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April 2000

Original source file: tacgps.0004
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0004

1. [tacgps] DGPS base station

From: Mathias Tobler <bagi@stars.ch>
Date: Sat, 01 Apr 2000 10:02:24 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74787-2000.04.01-02.04.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For a research project in Tanzania we need a DGPS base station for realtime correction. Has anyone ever built something like that or knows where to get a complete system that would work with Garmin 12XL and Trimbel GeoExplorer II? I have seen the base station on the TAPR webpage. Some questions to that. Can the Oncore VP be repalced with a newer (available) model? Has anyone built a transmitter for this base station. I am wondering if one could make a transmitter around 300 kHz so that standard beacon recivers could be used. Any ideas?

Mathias

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2. [tacgps] Re: DGPS base station

From: "Lyle Johnson" <wa7gxd@email.msn.com>
Date: Sat, 1 Apr 2000 15:34:02 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74863-2000.04.01-09.30.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

----- Original Message -----
From: Mathias Tobler <bagi@stars.ch>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Saturday, April 01, 2000 09:02
Subject: [tacgps] DGPS base station

> For a research project in Tanzania we need a DGPS base station for realtime
> correction. Has anyone ever built something like that or knows where to get
> a complete system that would work with Garmin 12XL and Trimbel GeoExplorer
> II?

Any standard DGPS base station will work.

>I have seen the base station on the TAPR webpage. Some questions to
> that. Can the Oncore VP be repalced with a newer (available) model

Not at this time.

> Has
> anyone built a transmitter for this base station. I am wondering if one
> could make a transmitter around 300 kHz so that standard beacon recivers
> could be used. Any ideas?

It woul dbe a simple project.

I suspect the Ashtech G12 is the lowest cost commercially available base station-capable GPS receiver these days.

As to a transmitter, there are all sorts of licensing issues, etc., that have to be taken into account.

Lyle

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3. [tacgps] Re: DGPS base station

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 01 Apr 2000 09:46:36 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74864-2000.04.01-09.43.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Lyle Johnson wrote:
>
> I suspect the Ashtech G12 is the lowest cost commercially available base
> station-capable GPS receiver these days.

I concur.

FWIW, the Ashtech formats are oublished, and with their hire of a new
s/w manager, they are more accessible for help/questions. They recently
made available via GPS the code for manipulating several of their Survey
and mapping receivers.

Gerry
--
Gerry Creager Spatial Sciences Laboratory
979.845.7201 Office Texas Agricultural Experiment Station
979.845.2273 Fax Texas A&M University System
979.228.7686 Pager (preferred) College Station, Texas 77843-2120
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4. [tacgps] Re: Post Processing

From: Jeff <barnie@flash.net>
Date: Sat, 01 Apr 2000 11:00:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74873-2000.04.01-12.01.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I had not previously heard that the code data and the carrier phase data were
not valid at the same epoch. However, there is a command, @@AE which
is the "output align" message. Quoting the manual: "This command, when
enabled, will align all receiver periodic outputs with the top of the minute."
While it is not clear this does what you want with respect to the measurement
epoch, I think it would be wise to do all of your characterizations with this
command enabled.

There are several of us out here that are interested in carrier-phase post-
processing. I am attempting to use algorithms from "Linear Algebra,
Geodesy, and GPS" by Gilbert Strang and Kai Borre. This book contains
Matlab code to do post processing from RINEX files (both the observation
files *.*o and the navigation files *.*n are necessary as the broadcast
ephemeris is needed.) If you have code that will generate the RINEX files
from Motorola binary, are you willing to make it available? It would be
a significant step forward....

One hitch with many of the post processing packages is that they need both
L1 and L2 data to function. Obviously, working with the Oncore we only
have L1 data at the measurement point. However, it one had a CORS site
nearby (how near??) that could be used to get dual frequency data and
therefore local ionospheric corrections.

Jeff Vollin, KC6WFU
barnie@flash.net

Gerry Creager N5JXS wrote:

> "Ira A. Wilner" wrote:
>
> > I've got a copy of Omni from NGS, written for DOS environment, which will
> > do post processing if we can get the VP output into RINEX. This is
> > precisely what I await!
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> I've got Omni as well as PAGES (which I use for my long-baseline
> processing and geodetic work). They are good example sets. What I have
> to do now is snag the appropriately time-tagged carrier phase info so we
> know what epochs to assign to what. As Tom points out, the carrier
> phase information isn't necessarily associated with the code-phase

> time-tagging. What we're going to end up doing is characterizing the
> latency statistically for several receivers and assigning an offset
> value that we consider characteristic of the receiver architecture.
> Unless anyone has a better idea! I'm open!
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> I also have some code-phase resolution (single difference) code from NGS
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> concentrate on for point-position resolution for this round.
>
> 73, gerry n5jxs
> --
> Gerry Creager   Spatial Sciences Laboratory
> 979.845.7201 Office   Texas Agricultural Experiment Station
> 979.845.2273 Fax   Texas A&M University System
> 979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
> gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
> "Opinions expressed are mine and do not necessarily represent those of
> Texas A&M University."
>
> ---
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5. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 01 Apr 2000 15:46:46 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-74910-2000.04.01-15.44.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jeff wrote:
>
> I had not previously heard that the code data and the carrier phase data were
> not valid at the same epoch. However, there is a command, @@AE which
> is the "output align" message. Quoting the manual: "This command, when
> enabled, will align all receiver periodic outputs with the top of the minute."
> While it is not clear this does what you want with respect to the measurement
> epoch, I think it would be wise to do all of your characterizations with this
> command enabled.

Unfortunately, it's been my experience that after doing an output align,
the code phase data are successfully aligned, but the carrier phase data
are lagging. 80-125 ms is the nominal number I remember, but I'm too
fogged to recall the variance.

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> processing. I am attempting to use algorithms from "Linear Algebra,
> Geodesy, and GPS" by Gilbert Strang and Kai Borre. This book contains
> Matlab code to do post processing from RINEX files (both the observation
> files *.*o and the navigation files *.*n are necessary as the broadcast
> ephemeris is needed.) If you have code that will generate the RINEX files
> from Motorola binary, are you willing to make it available? It would be
> a significant step forward....

My personal favorite is GPS Theory and Practice, by B.
Hofmann-Wellenhog, H. Lichtenegger, and J. Collins, Springer-Verlag, 4th
Ed. 1997.

I've looked at Leick, Strang and Borre and Hofmann-Wellinghog et al, and
found the latter the best as far as explanations, illustrations and
derivations.

> One hitch with many of the post processing packages is that they need both
> L1 and L2 data to function. Obviously, working with the Oncore we only
> have L1 data at the measurement point. However, it one had a CORS site
> nearby (how near??) that could be used to get dual frequency data and
> therefore local ionospheric corrections.

Not necessarily. Not the code I posted earlier. It's L1 only. L2, in
most of the Strang/Borre examples, is used to derive iono component
delay and correct for that. If you keep your baselines short enough, L1
works just fine, once the integer ambiguity is resolved. The L2
solution can assist in that, and a Widelane solution resolves much
faster, but you still bave to resolve the single freq ambiguity at some

point. I've done significant work with long baselines using
dual-frequency, double difference solutions, and have been routinely
achieving network solutions with < 3 cm error both horizontal and
vertical. Note that these lines are over 300 km, and most in the range
of 1000-1500 km. Single frequency double-difference just won't work
here. lines < 300 km, you should be able to resolve the ambiguity and
achieve a fixed solution almost every time.

Regards,
Gerry
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
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6. [tacgps] Re: Post Processing

From: Jeff <barnie@flash.net>
Date: Sun, 02 Apr 2000 13:53:54 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75046-2000.04.02-15.53.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager N5JXS wrote:

> Unfortunately, it's been my experience that after doing an output align,
> the code phase data are successfully aligned, but the carrier phase data
> are lagging. 80-125 ms is the nominal number I remember, but I'm too
> fogged to recall the variance.

 I am a little new to post-processing. How did you determine
this offset?

>   --SNIP-- Not necessarily. Not the code I posted earlier. It's L1 only.

I must have missed your post. Could you post the code again? Does it
include the Motorla to RINEX converter?

Thanks,
Jeff Vollin, KC6WFU
barnie@flash.net

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7. [tacgps] Re: Post Processing

From: Brooks Shera <ebs@lanl.gov>
Date: Sun, 2 Apr 2000 15:11:08 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75057-2000.04.02-17.10.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have written a program (Mot2Rnx) that reads Oncore VP binary and
writes Rinex records that are successfully processed by
the Strang-Borre Matlab routines, by GeoGenius (that is, until
my trial license expired), and by my own homebrew post-processing
software.

A plot of the results obtainable with a pair of Oncores is on
my webpage (www.rt66.com/~shera). The plot shows the baseline vector
between
two receivers that were about 3.5 km apart. The vector was computed every
30
seconds for a run lasting about 1/2 hour. At each 30-second interval the
integer ambiquity was estimated (using the LAMDBA method published by
P. de Jonge and C. Tiberius at the Delft University of Technology) and
the
baseline vector was calculated.

The successive positions typically differ by 100 microns or less (over 3

km baseline!)
and during the 1/2 hour run the position drifted 2-3 mm. This slow drift
may be due to multipath or incomplete cancellation of ionospheric effects.

The data were recorded at the ranch of a friend (N7ZT) in the basin &
range
country of Nevada, and both receivers were in separate shallow canyons.
No special precautions were made to avoid multipath reflections
(e.g. no choke rings mounts for the simple Motorola patch antennas).
The data were used to establish his property lines so he could put up a
fence
to keep his neighbors cows off his land. The accuracy of the data
appears
to be sufficient for the purpose. :-)

Anyone who is interested in Mot2Rnx.exe can send me a note, preferably
describing what they're up to.

A few comments on Mot2Rnx:

1. Depending on what header information your post-processing code expects
you might have to edit the ASCII header by hand. I have included
the easy stuff I think.

2. Some pp codes (e.g. GeoGenius) doesn't like the (drifting) 20,625 Hz LO
offset that Motorola rcvrs add to the carrier phase. I have fixed
this in the Rinex output records as well as I can (thanks to Dan Charrois
for suggestions regarding this problem). In fact, Mot2Rnx writes an output
file that you can plot to watch how your LO frequency drifts over
time (an expensive thermometer?).

3. I use TAC32 on a PC to record binary data from the fixed rcvr.
The initialization commands I use for the fixed rcvr are:

@@AE 01   -- output align
@@Ea 3C   -- Position/Status
@@Eg 1E   -- Carrier phase at 30 sec intervals
@@Bh 05   -- DGPS output every 5 sec
@@Bi 01   -- Ephemeris output (after you start recording)

I have to do these by hand with TAC32 (are you listening, Richard?)

The rover binary data is recorded by a PalmPilot. The Pilot
also initializes the Oncore and displays the current position. The
initialization is

@@Ea 01, @@Ek 01, @@Eg 1E, and @@AE 01

I usually have a packet radio DGPS link from the fixed rcvr to
the rover (to save a little money I transmit Motorola binary dgps
messages, not TAPR DGPS style RTCM since the receiving end is an
Oncore). DGPS lets me see where the rover is in "real time" with
an accuracy of a couple meters or so. The Palm software displays the
current and time-averaged DGPS corrected position while it's
recording the carrier phase data for processing later.

I am presently thinking about recording phase data at 2 fixed stations
(that have a known vector between them). The data from the rover
and the 2 fixed rcrvs would be analyzed together, the goal being
to speed up the estimation of the integer ambiguities. Presently
it takes someplace between 2 and 10 minutes of data to do this
depending on the geometry of the sats. I wonder if anyone has
tried this or has comments on the scheme.

Brooks

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8. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 02 Apr 2000 22:37:53 -0500

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75084-2000.04.02-22.35.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jeff wrote:
>
> Gerry Creager N5JXS wrote:
>
> > Unfortunately, it's been my experience that after doing an output align,
> > the code phase data are successfully aligned, but the carrier phase data
> > are lagging. 80-125 ms is the nominal number I remember, but I'm too
> > fogged to recall the variance.
>
> I am a little new to post-processing. How did you determine
> this offset?

By dent of superhuman effort, and a good mathematica toolset... and
having cross-checked the toolset with known results, I calculated the
single and double difference baselines. The similar, fixed solutions
from the code data were also calculated. They didn't agree, but the
code solutions agreed with other software that had used the same antenna
and coax, but a Trimble receiver and their Pathfinder software. From
that I determined that there was a delta. I did some quick and dirty
calculations on the differences but they were neither scientifically
undertaken, nor statistically rigorous, and I really don't remember them
them exactly, so I'm not reporting them. I need to revisit that (soon!)
and do it right.

> >   --SNIP-- Not necessarily. Not the code I posted earlier. It's L1 only.
>
> I must have missed your post. Could you post the code again? Does it
> include the Motorla to RINEX converter?

I'll make it available on page4.tamu.edu for anonymous download. It
DOES NOT have the OnCore-to-Rinex converter. I have to revisit, and
finish, that, too. http://page4.tamu.edu/Motorola

It'll be sometime Monday, 3 APR before it's there.
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
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9. [tacgps] RE: DGPS base station

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 3 Apr 2000 06:33:30 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75145-2000.04.03-06.35.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I used the Oncore VP to make a DGPS base station. I am using a ham
transmitter and a Pacomm Tiny TNC. My handhelds are Garmin 12XLs, GII+, and
a 12CX. I use a handheld ham receiver and another Pacomm TNC and input the
data into the handheld GPS. Works fine for about 7 miles around, which is
not bad for 25 watts and the antenna only being 30 feet in the air. I use
TAC32 software to set up and control the Oncore base station. Also use the
TAPR DGPS card. It reformats the binary data to RTCM type 1 data, 100 bps.
This gives you about 5 meter positioning in real time.

The new Oncore (12 channel) has not implemented DGPS generation yet. I
understand they plan to do it, later.

> ----------
> From: Mathias Tobler[SMTP:bagi@stars.ch]
> Reply To: TAPR Special Interest Group
> Sent: Saturday, April 01, 2000 3:02 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] DGPS base station
>
> For a research project in Tanzania we need a DGPS base station for

> realtime
> correction. Has anyone ever built something like that or knows where to
> get
> a complete system that would work with Garmin 12XL and Trimbel GeoExplorer
>
> II? I have seen the base station on the TAPR webpage. Some questions to
> that. Can the Oncore VP be repalced with a newer (available) model? Has
> anyone built a transmitter for this base station. I am wondering if one
> could make a transmitter around 300 kHz so that standard beacon recivers
> could be used. Any ideas?
>
> Mathias
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

10. [tacgps] GPS Book

From: Tom Cox <tom@cox.org>
Date: Tue, 4 Apr 2000 22:32:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75552-2000.04.05-00.28.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Someone recently mentioned (and endorsed) a book here: "My personal
favorite is GPS Theory and Practice, by B. Hofmann-Wellenhog, H.
Lichtenegger, and J. Collins, Springer-Verlag, 4th Ed. 1997."

Amazon.com and Springer-Verlag web sites don't recognize this title.
Any idea where to find it?

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] Re: GPS Book

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 05 Apr 2000 01:22:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75559-2000.04.05-01.19.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom Cox wrote:
>
> Someone recently mentioned (and endorsed) a book here: "My personal
> favorite is GPS Theory and Practice, by B. Hofmann-Wellenhog, H.
> Lichtenegger, and J. Collins, Springer-Verlag, 4th Ed. 1997."
>
> Amazon.com and Springer-Verlag web sites don't recognize this title.
> Any idea where to find it?

A quick search on amazon.com using the author's last name
(hofmann-wellinghog) yielded a quick hit, $5495, usually ships in 24
hrs.

That price, by the way is what they call "competetive" in some circles.

Gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Re: GPS Book

From: "Steve Sampson" <ssampson@usa-site.net>
Date: Wed, 5 Apr 2000 07:55:24 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75586-2000.04.05-07.54.52--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Most Springer-Verlog and Artech House books are best looked at
in a library first. Only rarely is the whole book useful, or one in which
you would treasure on your home shelf.

----- Original Message -----

> A quick search on amazon.com using the author's last name
> (hofmann-wellinghog) yielded a quick hit, $5495, usually ships in 24
> hrs.
>
> That price, by the way is what they call "competetive" in some circles.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: GPS Book

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 05 Apr 2000 09:23:33 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75596-2000.04.05-09.21.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve Sampson wrote:
>
> Most Springer-Verlog and Artech House books are best looked at
> in a library first. Only rarely is the whole book useful, or one in which
> you would treasure on your home shelf.

This one, however, is a keeper. It's what I plan to teach from when we
get the GPS courses on the books. It beats Alfred Leick's books
hands-down, and has some of the best treatments on theory and exercises
for the newcomer I've seen.
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: tacgps digest: March 30, 2000

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Thu, 6 Apr 2000 6:24:37
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75743-2000.04.06-06.24.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

GrafNav has a demo, but its limited to processing the data that comes with
it.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Using TAC-2 on network

From: "Chris Dapples" <ccdapple@wtp.net>
Date: Thu, 6 Apr 2000 10:14:33 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75787-2000.04.06-11.12.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi All,
        Some time ago there was a posting on how to setup the TAC-2 to set the time
on all computers on a Linux network. I am wondering if someone knows how to
do this
for a Windows2000 network?
        Chris/KF7KN
        ccdapple@wtp.net

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Motorola code up on page4.tamu.edu

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 06 Apr 2000 12:16:37 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75800-2000.04.06-12.17.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

It's posted:

I don't have a link yet on the homepage of page4.tamu.edu, so note the
URL.

Anonymous ftp: page4.tamu.edu, /pub/DGPS
httpd://page4.tamu.edu/pub/DGPS

*** From the readme that I've got there but isn't coming up when I hit
the
page:

The three directories have different data in them.

OnCore has the Motorola RTCM code for dos and linux.

dgpsip has the source for Wolfgang Ruppart's dgpsip client, and the
daemon, dgpsipd.

VBasic has some old code I did originally for Windoze in VB 3 or there
abouts for a base station based on the OnCore, and then didn't have time
to complete... and stopped using windoze...

In the OnCore directory, MOTRTCM has the dos and linux stuff as well as
some test files and docs. NGS-post has Dennis Milbert's L1
post-processing code and the NGS-Bluebook data. These are needed
because
it reads a file with assumed/known positions to seed the fixed site and
rover. This program is currently designed for static use, and not for
rovers. The input is 2 rinex files.

Gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Rockwell Jupiter GPS $69. Good Deal?

From: Pat Kilroy <pat.kilroy@gsfc.nasa.gov>
Date: Thu, 06 Apr 2000 13:32:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75803-2000.04.06-12.32.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>From: n5bfc@ARRL.NET
>To: simsat@listserv.gsfc.nasa.gov
>Date: Thu, 6 Apr 2000 10:32:03 -0500
>Subject: Rockwell Jupiter GPS $69. Good Deal?

>On page 137 of the Aprill 2000 QST is an ad for a $69 Rockwell
>Jupiter GPS (Rockwell p/n TU30-D140-211/221/223). The .PDF file
>for the unit can be found at
>http://www.unitronic.de/rockwell/pdf/gps/221_231.pdf
>
>A rough read of the specs indicate that the typical error is about
>25m, powered by 5 volts, and consumption is 195mA (975mW).
>
>Is this a good deal on a GPS for a [balloon]?
>

```
=====================================================================
Patrick L. Kilroy                                                 WK
Integration & Test Lead Engineer   Phone:  301-286-1984
NASA Goddard Space Flight Center   Fax:    301-286-1673
Building 5, Mail Code 568          E-mail: pat.kilroy@gsfc.nasa.gov
Greenbelt, Maryland  20771         Web:    http://sspp.gsfc.nasa.gov
=====================================================================

        Visit SimSat at http://garc.gsfc.nasa.gov/~simsat



---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

18. [tacgps] Re: Using TAC-2 on network

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 07 Apr 2000 19:41:36 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76064-2000.04.07-21.42.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I use timelord on W95 and W98, I haven't tried W2000, so I don't know if
it works probably does...

Set up one PC connected to the GPS running TAC s/w as the Server, and
then the other computers can ask it for time checks at whatever interval
is desired.

http://www.ossystems.co.uk/

Good luck,
Dan, W6LSN

```
---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

19. [tacgps] Re: Using TAC-2 on network

From: "bert weis" <bertweis@skynet.be>
Date: Sat, 8 Apr 2000 06:57:47 -0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76096-2000.04.08-01.59.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Do you know Tardis ? This is a time server that can obtain the correct time
from several sources, including GPStiming. It runs on WIN95/WIN98/NT/WIN2000
computers without any trouble and sends ntp packets at a definable rate. The
"client" computers run K95, a very small program which picks uo these
packets and synchronises the clocks. I have it running with a TAC-32 board
for almost a year now without any problem at all.

Tardis/K95 is shareware and can be found at http://www.kaska.demon.co.uk

```
-----Oorspronkelijk bericht-----
Van: Chris Dapples <ccdapple@wtp.net>
Aan: TAPR Special Interest Group <tacgps@lists.tapr.org>
Datum: donderdag 6 april 2000 17:23
Onderwerp: [tacgps] Using TAC-2 on network


>Hi All,
> Some time ago there was a posting on how to setup the TAC-2 to set the
time
>on all computers on a Linux network.  I am wondering if someone knows how
to
>do this
>for a Windows2000 network?
> Chris/KF7KN
> ccdapple@wtp.net
>
>
>---
```

>You are currently subscribed to tacgps as: on1awb@skynet.be
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] Motorola M12 GPS receiver

From: Kohjin Yamada <kohjin@marina.prug.or.jp>
Date: Sat, 08 Apr 2000 19:50:26 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: mac@ten.fujitsu.co.jp, akira@osk.3web.ne.jp
Message-ID: <LYR6754-76110-2000.04.08-06.46.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.

http://www.synergy-gps.com

The offer closes at the end of this month, I'm thinking to buy one
for my second receiver.

Does anyone use this with TAC32 or any comment?

Kohjin - JR1EDE

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Re: Using TAC-2 on network

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sat, 08 Apr 2000 16:02:43 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76141-2000.04.08-10.03.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The "professional" TAC32Plus version of Rick's software
(http://www.cnssys.com) includes an xntp server function.
If you want to see it work, try hitting my GPS R&D site:

        tac.ggao.nasa.gov = [192.225.79.116]

You will see it reports as being a Stratum 1 GPS-based time
server. FYI -- it is running on the Windoze 2000 machine
I use to monitor the performance of the site's Hydrogen
Maser.

Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] Re: Using TAC-2 on network

From: "Chris Dapples" <ccdapple@wtp.net>
Date: Sat, 8 Apr 2000 21:30:09 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76250-2000.04.08-22.31.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Picked up a copy today, but there is a problem now I can't figure out.
I have the time set in windows 2000 to GMT and all was OK until I
started
running Tardis 2000. I am using the time beacon from the GPS but now
the time on the computers is one hour ahead. I.e., the gps says 19:43
but
the computers running K9 and Tardis say 20:43 and manually changing
the
time in the control panel only holds until the next update beacon from
Tardis.
Any ideas what I have misconfigured?

-----Original Message-----

From: bounce-tacgps-8607@lists.tapr.org
[mailto:bounce-tacgps-8607@lists.tapr.org]On Behalf Of bert weis
Sent: Saturday, April 08, 2000 00:58
To: TAPR Special Interest Group
Subject: [tacgps] Re: Using TAC-2 on network

Do you know Tardis ? This is a time server that can obtain the correct
time
from several sources, including GPStiming. It runs on
WIN95/WIN98/NT/WIN2000
computers without any trouble and sends ntp packets at a definable
rate. The
"client" computers run K95, a very small program which picks uo these
packets and synchronises the clocks. I have it running with a TAC-32
board
for almost a year now without any problem at all.

Tardis/K95 is shareware and can be found at
http://www.kaska.demon.co.uk

-----Oorspronkelijk bericht-----
Van: Chris Dapples <ccdapple@wtp.net>
Aan: TAPR Special Interest Group <tacgps@lists.tapr.org>
Datum: donderdag 6 april 2000 17:23
Onderwerp: [tacgps] Using TAC-2 on network

>Hi All,
> Some time ago there was a posting on how to setup the TAC-2 to set
the
time
>on all computers on a Linux network. I am wondering if someone knows
how
to
>do this
>for a Windows2000 network?
> Chris/KF7KN
> ccdapple@wtp.net
>
>
>---
>You are currently subscribed to tacgps as: on1awb@skynet.be
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leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: ccdapple@wtp.net
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] Re: Using TAC-2 on network

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sat, 8 Apr 2000 23:15:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76257-2000.04.08-23.15.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Chris -

In your Windows 2000 setup for setting the local time -- set it to
Casablanca [GMT/UTC] ... which does not observe the Daylight Savings Time
seasonal changes. Saves you from the DST confusion as well as the different
spring weekend that Europe and Americas started observing past 2 weeks.

Cheers.

Greg
w9gb
----- Original Message -----

From: "Chris Dapples" <ccdapple@wtp.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, April 08, 2000 10:30 PM
Subject: [tacgps] Re: Using TAC-2 on network

> Picked up a copy today, but there is a problem now I can't figure out.
> I have the time set in windows 2000 to GMT and all was OK until I
> started
> running Tardis 2000. I am using the time beacon from the GPS but now
> the time on the computers is one hour ahead. I.e., the gps says 19:43
> but
> the computers running K9 and Tardis say 20:43 and manually changing
> the
> time in the control panel only holds until the next update beacon from
> Tardis.
> Any ideas what I have misconfigured?
>
> -----Original Message-----
> From: bounce-tacgps-8607@lists.tapr.org
> [mailto:bounce-tacgps-8607@lists.tapr.org]On Behalf Of bert weis
> Sent: Saturday, April 08, 2000 00:58
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Using TAC-2 on network
>
>
> Do you know Tardis ? This is a time server that can obtain the correct
> time
> from several sources, including GPStiming. It runs on
> WIN95/WIN98/NT/WIN2000
> computers without any trouble and sends ntp packets at a definable
> rate. The
> "client" computers run K95, a very small program which picks uo these
> packets and synchronises the clocks. I have it running with a TAC-32
> board
> for almost a year now without any problem at all.
>
> Tardis/K95 is shareware and can be found at
> http://www.kaska.demon.co.uk
>
>
> -----Oorspronkelijk bericht-----
> Van: Chris Dapples <ccdapple@wtp.net>
> Aan: TAPR Special Interest Group <tacgps@lists.tapr.org>
> Datum: donderdag 6 april 2000 17:23
> Onderwerp: [tacgps] Using TAC-2 on network
>
>
> >Hi All,
> > Some time ago there was a posting on how to setup the TAC-2 to set
> the
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> >on all computers on a Linux network. I am wondering if someone knows
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> >do this
> >for a Windows2000 network?
> > Chris/KF7KN
> > ccdapple@wtp.net
> >
> >
> >---
> >You are currently subscribed to tacgps as: on1awb@skynet.be
> >To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
> >
> >
>
>
> ---
> You are currently subscribed to tacgps as: ccdapple@wtp.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: Using TAC-2 on network

From: "Chris Dapples" <ccdapple@wtp.net>
Date: Sun, 9 Apr 2000 10:52:01 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76409-2000.04.09-11.52.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Greg, It never occurred to me that England, etc. used Daylight
savings. I thought
this was strictly an American folly.
73, Chris

-----Original Message-----
From: bounce-tacgps-8607@lists.tapr.org
[mailto:bounce-tacgps-8607@lists.tapr.org]On Behalf Of Gregory Beat
Sent: Saturday, April 08, 2000 22:15
To: TAPR Special Interest Group
Subject: [tacgps] Re: Using TAC-2 on network

Chris -

In your Windows 2000 setup for setting the local time -- set it to
Casablanca [GMT/UTC] ... which does not observe the Daylight Savings
Time
seasonal changes. Saves you from the DST confusion as well as the
different
spring weekend that Europe and Americas started observing past 2
weeks.

Cheers.

Greg
w9gb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: Using TAC-2 on network

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 9 Apr 2000 15:32:55 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76428-2000.04.09-15.33.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Daylight Savings is definitely not an American folly ..... the nightmares of
explaining these differences to programmers dealing with global software
interfaces .... I just wish the rest of the industries would adopt quickly
... but the the financial equity and derivative markets are still dealing
with fractions and not decimals. You don't want to know the headache of
supporting this approach.

BTW, you MAY be able to use the England GMT, but you would have to remember
to turn off the check mark for DST observance. I believe this box is shaded
out for Casablanca GMT !   Now why didn't Microsoft place UTC as an option?
(too busy hiring lawyers to maintain the monopoly)

GB

----- Original Message -----
From: "Chris Dapples" <ccdapple@wtp.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, April 09, 2000 11:52 AM
Subject: [tacgps] Re: Using TAC-2 on network

> Thanks Greg, It never occurred to me that England, etc. used Daylight
> savings. I thought
> this was strictly an American folly.
> 73, Chris
>

> -----Original Message-----
> From: bounce-tacgps-8607@lists.tapr.org
> [mailto:bounce-tacgps-8607@lists.tapr.org]On Behalf Of Gregory Beat
> Sent: Saturday, April 08, 2000 22:15
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Using TAC-2 on network
>
>
> Chris -
>
> In your Windows 2000 setup for setting the local time -- set it to
> Casablanca [GMT/UTC] ... which does not observe the Daylight Savings
> Time
> seasonal changes. Saves you from the DST confusion as well as the
> different
> spring weekend that Europe and Americas started observing past 2
> weeks.
>
> Cheers.
>
> Greg
> w9gb
>
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Re: Using TAC-2 on network

From: Malcolm Miles <mgm-ns@tardis.net>
Date: Mon, 10 Apr 2000 08:10:18 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76451-2000.04.09-17.12.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Sun, 9 Apr 2000 15:32:55 -0500, you wrote:

>BTW, you MAY be able to use the England GMT, but you would have to remember
>to turn off the check mark for DST observance. I believe this box is shaded
>out for Casablanca GMT !   Now why didn't Microsoft place UTC as an option?

No need to wait for Microsoft, you can add your own time zones pretty easily with a few registry tweaks.
 I'll post the details if anyone is interested.

--
Best wishes,
Malcolm

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: Using TAC-2 on network

From: "Chris Dapples" <ccdapple@wtp.net>
Date: Sun, 9 Apr 2000 16:44:53 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76455-2000.04.09-17.45.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Malcolm,
        I for one would be very interested in the details.

--Chris--

-----Original Message-----
From: bounce-tacgps-8607@lists.tapr.org
[mailto:bounce-tacgps-8607@lists.tapr.org]On Behalf Of Malcolm Miles
Sent: Sunday, April 09, 2000 16:10
To: TAPR Special Interest Group
Subject: [tacgps] Re: Using TAC-2 on network

On Sun, 9 Apr 2000 15:32:55 -0500, you wrote:

>BTW, you MAY be able to use the England GMT, but you would have to
remember
>to turn off the check mark for DST observance. I believe this box is
shaded
>out for Casablanca GMT !   Now why didn't Microsoft place UTC as an
option?

No need to wait for Microsoft, you can add your own time zones pretty
easily with a few registry tweaks. I'll post the details if anyone is
interested.

--
Best wishes,
Malcolm

You are currently subscribed to tacgps as: ccdapple@wtp.net
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] RE: Motorola M12 GPS receiver

From: "Bender, Mark E" <Mark.Bender@West.Boeing.com>
Date: Mon, 10 Apr 2000 07:21:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76559-2000.04.10-09.21.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am assuming that this kit requires an Oncore GPS engine... or is it
an actual 12 channel GPS system all for the 192.00 price tag?

Mark Bender - kd6not

> ----------
> From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> Reply To: TAPR Special Interest Group
> Sent: Saturday, April 08, 2000 3:50 AM
> To: TAPR Special Interest Group
> Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> Subject: [tacgps] Motorola M12 GPS receiver
>
> I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
>
> http://www.synergy-gps.com
>
> The offer closes at the end of this month, I'm thinking to buy one
> for my second receiver.
>
> Does anyone use this with TAC32 or any comment?
>
> Kohjin - JR1EDE
>
>
>
> ---
> You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] RE: Motorola M12 GPS receiver

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 10 Apr 2000 09:29:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76563-2000.04.10-09.31.56--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

>From Synergy's home page (http://www.synergy-gps.com/index.html): For first time customers interested in buying an M12 for evaluation, we are providing a special offer on the M12 Starter Kit, P/N 10001470. This Starter Kit normally priced at $192.00 is now available for only $96.00! The Starter Kit consists of an M12 Development Board & M12 GPS Receiver (shown in photo at left); 9VDC wall mount (115VAC, 60Hz) Power Supply; Active GPS Antenna; and Serial Cable. For additional information about the M12 Starter Kit as well as additional software and documentation options, please refer to the Synergy Systems Evaluation Kit Addendum. This offer is limited to Visa and MasterCard Purchases only, and it is limited to one kit per customer. This offer ends May 1, 2000, and is limited to the first 100 first time customers.

> ----------
> From: Bender, Mark E[SMTP:Mark.Bender@West.Boeing.com]
> Reply To: TAPR Special Interest Group
> Sent: Monday, April 10, 2000 9:21 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola M12 GPS receiver
>
> I am assuming that this kit requires an Oncore GPS engine... or is it
> an actual 12 channel GPS system all for the 192.00 price tag?
>
> Mark Bender - kd6not
>
>
> > ----------
> > From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> > Reply To: TAPR Special Interest Group
> > Sent: Saturday, April 08, 2000 3:50 AM
> > To: TAPR Special Interest Group
> > Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> > Subject: [tacgps] Motorola M12 GPS receiver
> >
> > I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
> >
> > http://www.synergy-gps.com
> >
> > The offer closes at the end of this month, I'm thinking to buy one
> > for my second receiver.
> >
> > Does anyone use this with TAC32 or any comment?
> >
> > Kohjin - JR1EDE
> >
> >
> >
> > ---
> > You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

30. [tacgps] RE: Motorola M12 GPS receiver

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Mon, 10 Apr 2000 09:48:04 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76568-2000.04.10-09.49.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark- It includes a receiver and more. I consider it to be a great deal! Antenna, receiver, interface board, power supply. Lots of fun for $96! (Not surprised that they limit the quantity to only 100 units at that price...)

73's

Gary N8DMT

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email.mot.com
Work Home Page: http://www.mot.com/telematics

Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Bender, Mark E [mailto:Mark.Bender@West.Boeing.com]
Sent: Monday, April 10, 2000 9:21 AM
To: TAPR Special Interest Group
Subject: [tacgps] RE: Motorola M12 GPS receiver

I am assuming that this kit requires an Oncore GPS engine... or is it
an actual 12 channel GPS system all for the 192.00 price tag?

Mark Bender - kd6not

> ----------
> From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> Reply To: TAPR Special Interest Group
> Sent: Saturday, April 08, 2000 3:50 AM
> To: TAPR Special Interest Group
> Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> Subject: [tacgps] Motorola M12 GPS receiver
>
> I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
>
> http://www.synergy-gps.com
>
> The offer closes at the end of this month, I'm thinking to buy one
> for my second receiver.
>
> Does anyone use this with TAC32 or any comment?
>
> Kohjin - JR1EDE
>
>
>
> ---
> You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: G13216@EMAIL1.WES.MOT.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] RE: Motorola M12 GPS receiver

From: Ray Vaughan <ray@rayvaughan.com>
Date: Mon, 10 Apr 2000 11:09:26 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76571-2000.04.10-10.10.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Is this kit compatible with the DGPS signal generation board that TAPR offers?
(http://www.tapr.org/tapr/html/Fdgps.html)

It does sound good to me too.   Maybe not a pretty unit, but with a case, it could make a nice tracker
if nothing else.

At 09:48 AM 4/10/00 -0500, you wrote:
>Mark- It includes a receiver and more. I consider it to be a great deal!
>Antenna, receiver, interface board, power supply. Lots of fun for $96!
>(Not surprised that they limit the quantity to only 100 units at that
>price...)
>
>73's
>
>Gary N8DMT
>
>Gary Mastenbrook, Product Visioneering, Motorola, Inc.
>50 E. Commerce Drive, Schaumburg, IL 60173
>Email: g13216@email.mot.com
>Work Home Page: http://www.mot.com/telematics
>Personal Home Page: http://www.qsl.net/n8dmt
>

>
>-----Original Message-----
>From: Bender, Mark E [mailto:Mark.Bender@West.Boeing.com]
>Sent: Monday, April 10, 2000 9:21 AM
>To: TAPR Special Interest Group
>Subject: [tacgps] RE: Motorola M12 GPS receiver
>
>
>I am assuming that this kit requires an Oncore GPS engine... or is it
>an actual 12 channel GPS system all for the 192.00 price tag?
>
>Mark Bender - kd6not
>
>
> > ----------
> > From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> > Reply To: TAPR Special Interest Group
> > Sent: Saturday, April 08, 2000 3:50 AM
> > To: TAPR Special Interest Group
> > Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> > Subject: [tacgps] Motorola M12 GPS receiver
> >
> > I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
> >
> > http://www.synergy-gps.com
> >
> > The offer closes at the end of this month, I'm thinking to buy one
> > for my second receiver.
> >
> > Does anyone use this with TAC32 or any comment?
> >
> > Kohjin - JR1EDE
> >
> >
> >
> > ---
> > You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
>
>---
>You are currently subscribed to tacgps as: G13216@EMAIL1.WES.MOT.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>---
>You are currently subscribed to tacgps as: ray@rayvaughan.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

Ray J. Vaughan, MS, CBTE
KD4BBM
ray@rayvaughan.com
ray@2-way.com
http://www.rayvaughan.com/

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

32. [tacgps] RE: Motorola M12 GPS receiver

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 10 Apr 2000 10:16:15 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76573-2000.04.10-10.18.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The M12 cannot generate DGPS yet, according to Synergy.   Motorola plans to
add it in the next year.

> ----------
> From: Ray Vaughan[SMTP:ray@rayvaughan.com]
> Reply To: TAPR Special Interest Group
> Sent: Monday, April 10, 2000 10:09 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola M12 GPS receiver
>
> Is this kit compatible with the DGPS signal generation board that TAPR
> offers? (http://www.tapr.org/tapr/html/Fdgps.html)
>

> It does sound good to me too.   Maybe not a pretty unit, but with a case,
> it could make a nice tracker if nothing else.
>
> At 09:48 AM 4/10/00 -0500, you wrote:
> >Mark- It includes a receiver and more. I consider it to be a great
> deal!
> >Antenna, receiver, interface board, power supply. Lots of fun for $96!
> >(Not surprised that they limit the quantity to only 100 units at that
> >price...)
> >
> >73's
> >
> >Gary N8DMT
> >
> >Gary Mastenbrook, Product Visioneering, Motorola, Inc.
> >50 E. Commerce Drive, Schaumburg, IL 60173
> >Email: g13216@email.mot.com
> >Work Home Page: http://www.mot.com/telematics
> >Personal Home Page: http://www.qsl.net/n8dmt
> >
> >
> >-----Original Message-----
> >From: Bender, Mark E [mailto:Mark.Bender@West.Boeing.com]
> >Sent: Monday, April 10, 2000 9:21 AM
> >To: TAPR Special Interest Group
> >Subject: [tacgps] RE: Motorola M12 GPS receiver
> >
> >
> >I am assuming that this kit requires an Oncore GPS engine... or is it
> >an actual 12 channel GPS system all for the 192.00 price tag?
> >
> >Mark Bender - kd6not
> >
> >
> > > ----------
> > > From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> > > Reply To: TAPR Special Interest Group
> > > Sent: Saturday, April 08, 2000 3:50 AM
> > > To: TAPR Special Interest Group
> > > Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> > > Subject: [tacgps] Motorola M12 GPS receiver
> > >
> > > I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
> > >
> > > http://www.synergy-gps.com
> > >
> > > The offer closes at the end of this month, I'm thinking to buy one
> > > for my second receiver.
> > >
> > > Does anyone use this with TAC32 or any comment?
> > >
> > > Kohjin - JR1EDE
> > >
> > >
> > >
> > > ---
> > > You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> > > To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
> > >
> >
> >---
> >You are currently subscribed to tacgps as: G13216@EMAIL1.WES.MOT.COM
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
> >---
> >You are currently subscribed to tacgps as: ray@rayvaughan.com
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
> Ray J. Vaughan, MS, CBTE
> KD4BBM
> ray@rayvaughan.com
> ray@2-way.com
> http://www.rayvaughan.com/
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

>

33. [tacgps] RE: Motorola M12 GPS receiver

From: "Steven R. Bible" <srbible@gate.net>
Date: Mon, 10 Apr 2000 11:23:20 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76574-2000.04.10-10.23.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have not had the opportunity to evaluate the latest M12 firmware revision
that has the DGPS corrections. As soon as I can, I'll let everyone on the
list know.

- Steve, N7HPR

> -----Original Message-----
> From: bounce-tacgps-5687@lists.tapr.org
> [mailto:bounce-tacgps-5687@lists.tapr.org]On Behalf Of Ray Vaughan
> Sent: Monday, April 10, 2000 11:09 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola M12 GPS receiver
>
>
> Is this kit compatible with the DGPS signal generation board that
> TAPR offers? (http://www.tapr.org/tapr/html/Fdgps.html)
>
> It does sound good to me too.   Maybe not a pretty unit, but with
> a case, it could make a nice tracker if nothing else.
>
> At 09:48 AM 4/10/00 -0500, you wrote:
> >Mark- It includes a receiver and more. I consider it to be a
> great deal!
> >Antenna, receiver, interface board, power supply. Lots of fun for $96!
> >(Not surprised that they limit the quantity to only 100 units at that
> >price...)
> >
> >73's
> >
> >Gary N8DMT
> >
> >Gary Mastenbrook, Product Visioneering, Motorola, Inc.
> >50 E. Commerce Drive, Schaumburg, IL 60173
> >Email: g13216@email.mot.com
> >Work Home Page: http://www.mot.com/telematics
> >Personal Home Page: http://www.qsl.net/n8dmt
> >
> >
> >-----Original Message-----
> >From: Bender, Mark E [mailto:Mark.Bender@West.Boeing.com]
> >Sent: Monday, April 10, 2000 9:21 AM
> >To: TAPR Special Interest Group
> >Subject: [tacgps] RE: Motorola M12 GPS receiver
> >
> >
> >I am assuming that this kit requires an Oncore GPS engine... or is it
> >an actual 12 channel GPS system all for the 192.00 price tag?
> >
> >Mark Bender - kd6not
> >
> >
> > ----------
> > From: Kohjin Yamada[SMTP:kohjin@marina.prug.or.jp]
> > Reply To: TAPR Special Interest Group
> > Sent: Saturday, April 08, 2000 3:50 AM
> > To: TAPR Special Interest Group
> > Cc: mac@ten.fujitsu.co.jp; akira@osk.3web.ne.jp
> > Subject: [tacgps] Motorola M12 GPS receiver
> >
> > I have found an M12 Starter Kit Promotional Offer $96.00 from Synergy.
> >
> > http://www.synergy-gps.com
> >
> > The offer closes at the end of this month, I'm thinking to buy one
> > for my second receiver.
> >
> > Does anyone use this with TAC32 or any comment?
> >

> > > Kohjin - JR1EDE
> > >
> > >
> > >
> > > ---
> > > You are currently subscribed to tacgps as: mark.e.bender@boeing.com
> > > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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> >
> >---
> >You are currently subscribed to tacgps as: G13216@EMAIL1.WES.MOT.COM
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
> >---
> >You are currently subscribed to tacgps as: ray@rayvaughan.com
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
> Ray J. Vaughan, MS, CBTE
> KD4BBM
> ray@rayvaughan.com
> ray@2-way.com
> http://www.rayvaughan.com/
>
> ---
> You are currently subscribed to tacgps as: SRBIBLE@GATE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

34. [tacgps] RE: Motorola M12 GPS receiver

From: Ray Vaughan <ray@rayvaughan.com>
Date: Mon, 10 Apr 2000 11:24:21 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76575-2000.04.10-10.24.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

As in a firmware upgrade? Or add a module? Or buy a whole new one?

At 10:16 AM 4/10/00 -0500, you wrote:

>The M12 cannot generate DGPS yet, according to Synergy.   Motorola plans to add it in the next year.

Ray J. Vaughan, MS, CBTE
KD4BBM
ray@rayvaughan.com
ray@2-way.com
http://www.rayvaughan.com/

35. [tacgps] RE: Motorola M12 GPS receiver

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 10 Apr 2000 10:27:00 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76576-2000.04.10-10.29.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Don't know.

> ----------
> From: Ray Vaughan[SMTP:ray@rayvaughan.com]
> Reply To: TAPR Special Interest Group
> Sent: Monday, April 10, 2000 10:24 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola M12 GPS receiver
>
> As in a firmware upgrade? Or add a module? Or buy a whole new one?
>
> At 10:16 AM 4/10/00 -0500, you wrote:
>
>
>
>   The M12 cannot generate DGPS yet, according to Synergy.   Motorola

> plans to add it in the next year.
>
>
>
>
>
> Ray J. Vaughan, MS, CBTE
> KD4BBM
> ray@rayvaughan.com
> ray@2-way.com
> http://www.rayvaughan.com/
>

36. [tacgps] RE: Motorola M12 GPS receiver

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 10 Apr 2000 10:45:27 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76582-2000.04.10-10.46.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Bender, Mark E" wrote:
>
> I am assuming that this kit requires an Oncore GPS engine... or is it
> an actual 12 channel GPS system all for the 192.00 price tag?

The M12 is the follow-on to the OnCore, but unless they've had a change
of heart, it doesn't have carrier phase data.

Gerry n5jxs
--
Gerry Creager   Spatial Sciences Laboratory
979.845.7201 Office   Texas Agricultural Experiment Station
979.845.2273 Fax   Texas A&M University System
979.228.7686 Pager (preferred)   College Station, Texas 77843-2120
gerry@page4.tamu.edu   Pager: 9792287686@page.metrocall.com
"Opinions expressed are mine and do not necessarily represent those of
Texas A&M University."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] Re: Using TAC-2 on network

From: Jeff King <jeff@aerodata.net>
Date: Tue, 11 Apr 2000 00:50:04 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76702-2000.04.10-23.49.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

It was my understanding, as of 4 months ago, that Tardis didn't
support a 1PPS signal. The only think I found that did that was
the professional version of TAC32, and it wasn't cheap.

Now, I have heard that there is a program that comes with WindowsNT
that can act as a network time server, I'm not 100% sure it supports
the 1PPS signal though.

Without this 1PPS signal, your depending on your serial port to set the time.

Now, I think Tardis does support the Jupiter binary serial mode, which is more
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-Jeff

At 06:57 AM 4/8/00 +0000, bert weis wrote:
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>Tardis/K95 is shareware and can be found at http://www.kaska.demon.co.uk
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>
>-----Oorspronkelijk bericht-----
>Van: Chris Dapples <ccdapple@wtp.net>
>Aan: TAPR Special Interest Group <tacgps@lists.tapr.org>
>Datum: donderdag 6 april 2000 17:23

>Onderwerp: [tacgps] Using TAC-2 on network
>
>
>>Hi All,
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38. [tacgps] Re: Using TAC-2 on network

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Tue, 11 Apr 2000 08:21:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76981-2000.04.12-12.14.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

So far, this thread has addressed Wintel machines. Could anyone please
comment on either Sun/Solaris or Linux applications to address this need?
(I'm getting ready to setup time serving on my internal network, but won't
have a wintel box available. First choice: my ThinLinux based
router/firewall from edge.fireplug.net, second choice: SPARCstation LX
internal network server w/ Solaris 7) Thanks! Apologies if someone has
already addressed this question back in the archives...

73's

Gary N8DMT

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email.mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Jeff King [mailto:jeff@aerodata.net]
Sent: Monday, April 10, 2000 11:50 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: Using TAC-2 on network

It was my understanding, as of 4 months ago, that Tardis didn't
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the professional version of TAC32, and it wasn't cheap.

Now, I have heard that there is a program that comes with WindowsNT
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>Aan: TAPR Special Interest Group <tacgps@lists.tapr.org>
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---
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39. [tacgps] Re: Using TAC-2 on network

From: John Ackermann <jra@febo.com>
Date: Wed, 12 Apr 2000 13:26:48 -0300
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: jra@meow.febo.com
Message-ID: <LYR6754-76987-2000.04.12-12.27.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The ntp software reference implementation has been ported to a bunch of
Un*x platforms, as well as Windows (not certain just what versions).
The current release (version 4.0.99) has a reference clock driver for
the Oncore built in. The earlier 3-5.91 version does not directly support
the Oncore out of the box, but can be made to do so in a couple of ways.

I know that lots of folks have used ntp on Solaris machines, and there's
quite a bit of activity on both Linux and FreeBSD -- both these have
the ability to control the sysetm clock using a 1pps input, and can keep
time to within microseconds.

Check www.ntp.org for more details. There's a good newsgroup,
comp.protocol.time.ntp, which is low volume and has lots of good info,
and particularly announcements of new ntp versions and the patches used
with Linux for kernel timekeeping.

73,
John N8UR
jra@febo.com

In message <LYR5592-76981-2000.04.12-12.14.09--JRA#FEBO.COM@lists.tapr.org>, Ma
stenbrook Gary-G13216 writes:
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>Gary N8DMT
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>Gary Mastenbrook, Product Visioneering, Motorola, Inc.
>50 E. Commerce Drive, Schaumburg, IL 60173
>Email: g13216@email.mot.com
>Work Home Page: http://www.mot.com/telematics
>Personal Home Page: http://www.qsl.net/n8dmt
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>From: Jeff King [mailto:jeff@aerodata.net]
>Sent: Monday, April 10, 2000 11:50 PM
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>Subject: [tacgps] Re: Using TAC-2 on network
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40. [tacgps] NTP 4 and ONCORE VP 8.8

From: "Darryl Smith" <darryl@radio-active.net.au>
Date: Tue, 18 Apr 2000 19:59:21 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78357-2000.04.18-05.00.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

G'Day All....

I am trying to get NTP 4 working on one of my LINUX boxes and am having
problems... I have linked /dev/oncore.serial.1 to /dev/ttyC0, and also wired
the serial port so that /dev/ttyC4,5,6 and 7 are getting the same data READ
ONLY. There is no problem with the hardware.

MOTRTCM is running at the moment on /dev/ttyC7 with no problems, generating
dGPS data... and feeding it into aprsD. Opening a TERMINAL session on
/dev/ttyC0 or /dev/oncore.serial.1 brings up the ONCORE data....

I am getting nowhere slowly.... I would appreciate some help. I am
attempting to use the ONCORE driver in NTP. I have read the new MINI-HOWTO
on www.ntp.org, and am amazed at how technical a mini-howto that is supposed
to be non-technical is... And how long it is... The documentation for NTP
seems to be nothing more than the RFC and the CODE.

Any help would be appreciated...

Darryl VK2TDS

p.s. I can open the machine up if someone wants to have a look round...
thanks to a permament internet connection... The machine only runs as a
terminal server (10 serial ports) and a dGPS server, and soon a
time-server....

At one stage the logs said...

Apr 17 22:25:58 terminal ntpd[2920]: using kernel phase-lock loop 0041
Apr 17 22:25:58 terminal ntpd[2920]: refclock_newpeer: clock type 30 invalid
1
Apr 17 22:25:58 terminal ntpd[2920]: configuration of 127.127.30.1 failed
Apr 17 22:25:58 terminal ntpd[2920]: frequency initialized 0.000 from
/var/lib/
Apr 17 22:25:58 terminal ntpd[2920]: using kernel phase-lock loop 0041
Apr 17 22:26:04 terminal ntpd[2922]: ntpd 4.0.99i Mon Apr 17 23:09:20 EST
2000
Apr 17 22:26:04 terminal ntpd[2922]: precision = 17 usec
Apr 17 22:26:04 terminal ntpd[2922]: using kernel phase-lock loop 0041
Apr 17 22:26:04 terminal ntpd[2922]: refclock_newpeer: clock type 30 invalid
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Apr 17 22:26:04 terminal ntpd[2922]: frequency initialized 0.000 from
/var/lib/

my ntp.conf file is

```
# NTP configuration file (ntp.conf)
server 127.127.30.1 mode 0 minpoll 4 maxpoll 4
driftfile /var/lib/ntp/ntp.drift # remember the drift value
logfile /var/log/ntp/xntpd # log file
statsdir /var/log/ntp/ # directory for stats files
statistics loopstats peerstats clockstats # keep these stats
filegen loopstats file loopstats type day enable
filegen peerstats file peerstats type day enable
filegen clockstats file clockstats type day enable
```

Darryl Smith, VK2TDS POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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41. [tacgps] M12 - not ready for prime timing

From: Brooks Shera <ebs@lanl.gov>
Date: Fri, 21 Apr 2000 10:01:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79010-2000.04.21-11.02.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Yesterday I received my Oncore M12 eval kit with version 1.3 software
from Synergy. The 1.3 software lets the M12 output pseudorange
correction messages, so it could presumably serve as a dgps reference
station. I haven't tested this feature yet.

I was primarily interested in the quality of the 1 pps timing output for
controlling a frequency standard. The Motorola spec says the 1 pps
output is within +/- 500 nsec of UTC. This may be correct but the timing
of the 1 pps (even in position hold mode) jumps back and forth but
several hundred nsec from 1 second to the next. In this respect the
performance is about 10 times poorer than the Motorola UT. Of course the
M12 was not billed as a timing receiver, but I had hopes that it would be
better than it seems to be.

However, the good news is that the M12 eval kit is a super bargin. For
$96 (until May 1) you get the M12 mounted on a PC board with LEDs, DB-9
I/O ports, a power supply, a Motorola mag mount gps antenna --
everything you need. Five minutes out of the box and I had it running
under TAC32 and spitting out its position. All this and a 12 channel
receiver!

I await word from the DGPS guys in the group about it's performance in
that area.

Brooks

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42. [tacgps] Re: M12 - not ready for prime timing

From: "Doug McKinney" <Design@mt.to>
Date: Fri, 21 Apr 2000 09:20:46 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79020-2000.04.21-11.21.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

----- Original Message -----
From: "Brooks Shera" <ebs@lanl.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Friday, April 21, 2000 10:01 AM
Subject: [tacgps] M12 - not ready for prime timing

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vendor for Motorola. So, that may answer a possible reason for the poor
quality (lack of an acceptable Xtal replacement). I can only assume that
the UT+ is using a simular Xtal, that the VP used, and that the few
remaining vendor stocks may be being used to support the UT+. Motorola has
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is enough for almost all navigation, they may have fallen to market demands
for 12 channels and at a lower cost.

Steve Bible and I are looking into the M12 DGPS. The literature is not
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Steve to evaluate, but it needs a filmware update. He received a new unit
from Art, last week, and just got home and will be testing for DGPS. If it
is successful Steve and I will be putting together a DGPS Ref Station board
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43. [tacgps] Re: M12 - not ready for prime timing

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 21 Apr 2000 13:21:00 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79031-2000.04.21-12.21.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Can anyone point me at a source of information on this M12
evaluation
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        Thanks Bob Smith, WA4YPV

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>
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> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
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> You are currently subscribed to tacgps as: bobsmith5@home.com
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--

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landline   804/745-1065   Richmond, Virginia
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44. [tacgps] Re: M12 - not ready for prime timing

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Fri, 21 Apr 2000 12:25:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79032-2000.04.21-12.29.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

http://www.synergy-gps.com/ on this page

> ----------
> From: Bob Smith[SMTP:bobsmith5@home.com]
> Reply To: TAPR Special Interest Group

> Sent: Friday, April 21, 2000 12:21 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: M12 - not ready for prime timing
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> >
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> > stating what is really possible. I sent my early version of the M12 to
> > Steve to evaluate, but it needs a filmware update. He received a new
> unit
> > from Art, last week, and just got home and will be testing for DGPS. If
> it
> > is successful Steve and I will be putting together a DGPS Ref Station
> board
> > in SMD. I was considering the addition of the timing circuit, on the
> board,
> > but now need to see if it's even worth considering!
> >
> > Doug
> >
> > >
> > > However, the good news is that the M12 eval kit is a super bargin. For
> > > $96 (until May 1) you get the M12 mounted on a PC board with LEDs,
> DB-9
> > > I/O ports, a power supply, a Motorola mag mount gps antenna --
> > > everything you need. Five minutes out of the box and I had it running
> > > under TAC32 and spitting out its position. All this and a 12 channel
> > > receiver!
> > >
> > > I await word from the DGPS guys in the group about it's performance in
> > > that area.
> > >
> > > Brooks

> > >
> > > ---
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> > > To unsubscribe send a blank email to
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> > You are currently subscribed to tacgps as: bobsmith5@home.com
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>
> --
>
> --------- Avoid computer viruses -- Practice safe hex
> -------------
> * * Specializing in small, cost effective embedded control
> systems * *
> Robert L. (Bob) Smith   Smith Machine Works, Inc.
> internet   bobsmith5@home.com   9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia
> 23236+1004
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

45. [tacgps] Re: M12 - not ready for prime timing (NTP)

From: Reg Clemens <reg@dwf.com>
Date: Fri, 21 Apr 2000 13:38:17 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79060-2000.04.21-14.40.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just a note to let you know that I AM adding M12 support to the ONCORE
Driver in NTP. I have the manual, but haven't received my eval kit
from Synergy yet, so it will be a couple of weeks before the changes
make it into the distributed version.

Actually, in terms of timing, there are two problems. The worst is
the fact that has been mentioned, The XTAL (and the timing specs) are
an order of magnitude worse than the VP.

The other point, which takes some re-arrangement of the code is the fact
that there is no TRAIM output either. Oh well, you hardly need a correction
for the last 50ns when the unit is only speced at +-500ns...

                                Reg.Clemens
                                reg@dwf.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

46. [tacgps] Re: M12 - not ready for prime timing (NTP)

From: G Sanders <gsanders1@bigfoot.com>
Date: Fri, 21 Apr 2000 16:52:49 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79090-2000.04.21-15.54.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I just got off the phone with Synergy, and ordered my M12 kit.

She mentioned that due to the high demand, I shouldn't expect
to receive my kit before May 15th. (Hopefully you got your
order in a little before me!)

Gary Sanders

Reg Clemens wrote:
>
> Just a note to let you know that I AM adding M12 support to the ONCORE
> Driver in NTP. I have the manual, but haven't received my eval kit
> from Synergy yet, so it will be a couple of weeks before the changes
> make it into the distributed version.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

47. [tacgps] Re: M12 - not ready for prime timing

From: Brooks Shera <ebs@lanl.gov>
Date: Fri, 21 Apr 2000 15:24:24 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79122-2000.04.21-16.25.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Following Doug's lead I had a look at the stability of the local
oscillator
in the M12 (the @@Ha message outputs the time of each measurement epoch
from which the oscillator offset from the L1 freq can be computed). I
find that the frequency drifts only a few Hz (at 1575 MHz) from one
second to the next. This is about the same drift as my Oncore VPs, and
not enough to explain the timing jitter of the M12.

I rather think the jitter can be traced back to the marketing department
at Motorola - maybe the UT Sales Manager? :-)

Even though the jitter is pretty large for disciplining a freq standard,
it sure is good enough to set a PC clock and the users of TAC shouldn't
notice any difference. I would'nt cross it off for these uses.

Brooks

>Doug KcKinney wrote:

>Talking to Art, a few months ago, about the demise of the VP, it was found
>out that the Xtal used for the VP was no longer going to be made by the
>vendor for Motorola. So, that may answer a possible reason for the poor
>quality (lack of an acceptable Xtal replacement). I can only assume that
>the UT+ is using a simular Xtal, that the VP used, and that the few
>remaining vendor stocks may be being used to support the UT+. Motorola has
>seen the market pressure for 12 channels and even though they beleive that 8
>is enough for almost all navigation, they may have fallen to market demands
>for 12 channels and at a lower cost.
>
>Steve Bible and I are looking into the M12 DGPS. The literature is not
>stating what is really possible. I sent my early version of the M12 to
>Steve to evaluate, but it needs a filmware update. He received a new unit
>from Art, last week, and just got home and will be testing for DGPS. If it
>is successful Steve and I will be putting together a DGPS Ref Station board
>in SMD. I was considering the addition of the timing circuit, on the board,
>but now need to see if it's even worth considering!

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

48. [tacgps] Re: M12 - not ready for prime timing (NTP)

From: Reg Clemens <reg@dwf.com>
Date: Fri, 21 Apr 2000 17:50:20 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79152-2000.04.21-18.52.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>
> I just got off the phone with Synergy, and ordered my M12 kit.
>
> She mentioned that due to the high demand, I shouldn't expect
> to receive my kit before May 15th. (Hopefully you got your
> order in a little before me!)
>
> Gary Sanders
>
>
> Reg Clemens wrote:
> >
> > Just a note to let you know that I AM adding M12 support to the ONCORE
> > Driver in NTP. I have the manual, but haven't received my eval kit
> > from Synergy yet, so it will be a couple of weeks before the changes
> > make it into the distributed version.
>
> ---

> You are currently subscribed to tacgps as: REG@DWF.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
Yes, found it outside the front door when I went out for mail...

--
                                        Reg.Clemens
                                        reg@dwf.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

49. [tacgps] Re: M12 - not ready for prime timing

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 22 Apr 2000 09:04:44 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79220-2000.04.22-08.05.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Brooks,

I noted with much interest your posting on the M12 Evalution
Kit from Synergy Systems.

After some coorespondence with Synergy and additional visits
to their web site the closest thing I can find is their M12
Evaluation Kit P/N 100001470 priced at $192.00.

Is the $96.00 price that you mentioned correct? Is it a
special promotional price? I will call them soon, but this
being the Easter weekend, it may be several days before I
can get through.

Any clarification that you can provide will be most
appreciated.

        Thank you es 73, de bob, wa4ypv

Brooks Shera wrote:
>
> Yesterday I received my Oncore M12 eval kit with version 1.3 software
> from Synergy. The 1.3 software lets the M12 output pseudorange
> correction messages, so it could presumably serve as a dgps reference
> station. I haven't tested this feature yet.
>
> I was primarily interested in the quality of the 1 pps timing output for
> controlling a frequency standard. The Motorola spec says the 1 pps
> output is within +/- 500 nsec of UTC. This may be correct but the timing
> of the 1 pps (even in position hold mode) jumps back and forth but
> several hundred nsec from 1 second to the next. In this respect the
> performance is about 10 times poorer than the Motorola UT. Of course the
> M12 was not billed as a timing receiver, but I had hopes that it would be
> better than it seems to be.
>
> However, the good news is that the M12 eval kit is a super bargin. For
> $96 (until May 1) you get the M12 mounted on a PC board with LEDs, DB-9
> I/O ports, a power supply, a Motorola mag mount gps antenna --
> everything you need. Five minutes out of the box and I had it running
> under TAC32 and spitting out its position. All this and a 12 channel
> receiver!
>
> I await word from the DGPS guys in the group about it's performance in
> that area.
>
> Brooks
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex

```
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 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith                   Smith Machine Works, Inc.
internet   bobsmith5@home.com           9900 Lumlay Road
landline   804/745-1065                 Richmond, Virginia
23236+1004

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

50. [tacgps] Re: M12 - not ready for prime timing

```
From: "Doug McKinney" <Design@mt.to>
Date: Sat, 22 Apr 2000 06:25:09 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79224-2000.04.22-08.25.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
----- Original Message -----
From: "Bob Smith" <bobsmith5@home.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, April 22, 2000 6:04 AM
Subject: [tacgps] Re: M12 - not ready for prime timing


> Hello Brooks,
>
> I noted with much interest your posting on the M12 Evalution
> Kit from Synergy Systems.
>
> After some coorespondence with Synergy and additional visits
> to their web site the closest thing I can find is their M12
> Evaluation Kit P/N 100001470 priced at $192.00.
>
> Is the $96.00 price that you mentioned correct?  Is it a
> special promotional price?  I will call them soon, but this
> being the Easter weekend, it may be several days before I
> can get through.

Yes, it is a promotion to the first 100 new customers, so don't delay!  It
is the $192 for $96!

Doug

>
> Any clarification that you can provide will be most
> appreciated.
>
> Thank you es 73, de bob, wa4ypv
>
>
>
> Brooks Shera wrote:
> >
> > Yesterday I received my Oncore M12 eval kit with version 1.3 software
> > from Synergy.  The 1.3 software lets the M12 output pseudorange
> > correction messages, so it could presumably serve as a dgps reference
> > station.  I haven't tested this feature yet.
> >
> > I was primarily interested in the quality of the 1 pps timing output for
> > controlling a frequency standard.  The Motorola spec says the 1 pps
> > output is within +/- 500 nsec of UTC. This may be correct but the timing
> > of the 1 pps (even in position hold mode) jumps back and forth but
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> > performance is about 10 times poorer than the Motorola UT.  Of course
the
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> > better than it seems to be.
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> > receiver!
> >
> > I await word from the DGPS guys in the group about it's performance in
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> > that area.
> >
> > Brooks
> >
> > ---
> > You are currently subscribed to tacgps as: bobsmith5@home.com
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> --
>
> --------- Avoid computer viruses -- Practice safe hex
> -------------
> * * Specializing in small, cost effective embedded control
> systems * *
> Robert L. (Bob) Smith Smith Machine Works, Inc.
> internet   bobsmith5@home.com 9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia
> 23236+1004
>
> ---
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>

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51. [tacgps] Re: M12 - not ready for prime timing

From: G Sanders <gsanders1@bigfoot.com>
Date: Sat, 22 Apr 2000 18:16:14 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79299-2000.04.22-17.17.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Scroll down on Synergy's home page. It's on the "bottom half"
of the page (It's off the screen on my monitor when the
page initially loads). It IS 96 bucks.

I ordered mine a day or two ago, and they are quoting
delivery around May 15th.

Gary Sanders

Bob Smith wrote:
>
> After some coorespondence with Synergy and additional visits
> to their web site the closest thing I can find is their M12
> Evaluation Kit P/N 100001470 priced at $192.00.
>
> Is the $96.00 price that you mentioned correct? Is it a
> special promotional price?

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52. [tacgps] Re: M12 - not ready for prime timing

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Tue, 25 Apr 2000 0:13:15
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79825-2000.04.25-00.14.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I got a M12 eval kit today. I had a few problems getting it to take RTCM.
The second comm port, has to have RTCM put in on Pin 2 (on the eval
interface). By default, it is set to 9600 BPS. The @@Ao command allows
you to set 9600/4800/2400. At 9600 and having the GPS in the binary mode,
TAC32 only said DGPS. It did not show any delay time. When you switch to
NEMA, TAC32 displays the delay time.

Also, the second port appears to be wired to the first port. I could not
shoot any command when RTCM was being injected. TAC32 said there was not a
receiver. After disconnecting RTCM, it was OK.

Also, noticed the receiver has a problem locking up on RTCM at 4800 Bps.

The delay time would start at 4,5,6, seconds and then go to 15 to 60
seconds before it lock up again.

Noticed a small crystal on the bottem of the GPS board. I did not take the
board off the interface, but I plan to, to see its frequency. I'm
wondering if we can inject a better, more stable frequency (in place of the
crystal oscillator) and get stable timing out of the unit. TAC32 showed
timing slipping up to 1100 Ns worst case. And a scope, compared to a
Oncore VP, showed it all over the place.

But for $99, I can't complain. The GPS board sure is small ! Also the
antenna connector is a little bit smaller than the usual MCX. I use bias
tees and power dividers to feed my units, so I had to cut the cord off the
included antenna and put a connector on it to get to my power dividers (I
was hoping to use a spare MCX cable I had).

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

53. [tacgps] Re: M12 - not ready for prime timing

From: Reg Clemens <reg@dwf.com>
Date: Tue, 25 Apr 2000 12:00:02 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79943-2000.04.25-13.02.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In your message you said

> I use bias
> tees and power dividers to feed my units, so I had to cut the cord off the
> included antenna and put a connector on it to get to my power dividers

Is this something you built up yourself, or is it a commercial product ($$$).
I would like to split the signal coming down from the GPS antenna on my roof,
but havent thought seriously about the problem yet.

--
Reg.Clemens
reg@dwf.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

54. [tacgps] RE: Multiple Receivers -- Single Antenna

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Tue, 25 Apr 2000 15:35:16 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79963-2000.04.25-15.36.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Reg-

For my multiple receiver distribution system at home, I use Mini-Circuits*
parts:

Splitter, ZAPD-2, $54.95 new (2 way splitter) or ZA4PD-2, $89.95 new (4 way
splitter)

Bias-Tee, ZFBT-4R2G-FT, $59.95 new (only one needed for a two way split)

I bought a ZAPD-2 and the bias-tee at a local hamfest for about $15 for the
pair. The bias-tee keeps the bias supplied from the receivers separated, as
well as providing a DC current sink for the approx. 20 mA antenna source
current from the GPS receiver not DC-coupled to the antenna via the
splitter. A 270 Ohm resistor is connected from the feedthrough pin to
ground to make the second receiver "happy" during antenna current testing.

Keep a look-out for this stuff and maybe you'll get it cheap! On the other
hand, you'd be surprised how many people ask top dollar for little modules
just because they have SMA or N connectors on them. I try to carry a
Mini-Circuits catalog with me when I go to hamfests so I can show them what
the NEW (with warranty) cost is, and then can usually negotiate a reasonable
price for their used/untested merchandise. Besides, I can't keep all these

numbers straight in my head so I need to look them up anyway!

I don't mean to disregard the other approach to this problem: building a
simple circuit which splits and provides DC isolation/termination to one of
the branches. This would not be a tough design given the limited bandwidth
requirements, but given the need for lumped elements and/or a stripline
design plus packaging and connectors, I've chosen the used-but-inexpensive
modular approach for my lab. Bolt it together and go!

73's

Gary N8DMT

*Usual Disclaimer: Own no stock or interest, just a regular customer...

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email.mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Reg Clemens [mailto:reg@dwf.com]
Sent: Tuesday, April 25, 2000 1:00 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: M12 - not ready for prime timing

In your message you said

> I use bias
> tees and power dividers to feed my units, so I had to cut the cord off the

> included antenna and put a connector on it to get to my power dividers

Is this something you built up yourself, or is it a commercial product
($$$).
I would like to split the signal coming down from the GPS antenna on my
roof,
but havent thought seriously about the problem yet.

--
Reg.Clemens
reg@dwf.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

55. [tacgps] Re: M12 - not ready for prime timing

From: "myoung" <myoung@neo.rr.com>
Date: Tue, 25 Apr 2000 17:11:54 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79969-2000.04.25-16.19.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 02:00 PM 4/25/00 , you wrote:

>I would like to split the signal coming down from the GPS antenna on my roof,
>but havent thought seriously about the problem yet.
>
>
>--
>   Reg.Clemens
>   reg@dwf.com

I'm using a digital satellite splitter from Skyvision. Part #04-3000005.
It sells for 10.95 plus shipping. Works great. If used with an active
antenna the losses are negligible.

www.skyvision.com

Check it out.

Mike, WB8CXO

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

56. [tacgps] RE: Multiple Receivers -- Single Antenna

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 25 Apr 2000 17:20:11 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-79971-2000.04.25-16.22.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For a nice package check out
http://www.fleetpc.com/accessories/accessories.html under GPS Antenna
Splitters. This is the new home for WR, Inc. products. I use the "Loaded DC
Blocked Splitter 1 Input 4 Outputs" part number ALDCBS1X4 with Hi-Isolation
option. OK, so the list price of this one is $495 + $100. The passive 1x2
splitter, pn LDCBS1X2, is $295; the 4-way is $395.

These prices are higher than other approaches but these are very nice units
and are self-contained.

Rick
WB2TNL

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Mastenbrook
Gary-G13216
Sent: Tuesday, April 25, 2000 4:35 PM
To: TAPR Special Interest Group
Subject: [tacgps] RE: Multiple Receivers -- Single Antenna

Reg-

For my multiple receiver distribution system at home, I use Mini-Circuits*
parts:

Splitter, ZAPD-2, $54.95 new (2 way splitter) or ZA4PD-2, $89.95 new (4 way
splitter)

Bias-Tee, ZFBT-4R2G-FT, $59.95 new (only one needed for a two way split)

I bought a ZAPD-2 and the bias-tee at a local hamfest for about $15 for the
pair. The bias-tee keeps the bias supplied from the receivers separated, as
well as providing a DC current sink for the approx. 20 mA antenna source
current from the GPS receiver not DC-coupled to the antenna via the
splitter. A 270 Ohm resistor is connected from the feedthrough pin to
ground to make the second receiver "happy" during antenna current testing.

Keep a look-out for this stuff and maybe you'll get it cheap! On the other
hand, you'd be surprised how many people ask top dollar for little modules
just because they have SMA or N connectors on them. I try to carry a
Mini-Circuits catalog with me when I go to hamfests so I can show them what
the NEW (with warranty) cost is, and then can usually negotiate a reasonable
price for their used/untested merchandise. Besides, I can't keep all these
numbers straight in my head so I need to look them up anyway!

I don't mean to disregard the other approach to this problem: building a
simple circuit which splits and provides DC isolation/termination to one of
the branches. This would not be a tough design given the limited bandwidth
requirements, but given the need for lumped elements and/or a stripline
design plus packaging and connectors, I've chosen the used-but-inexpensive
modular approach for my lab. Bolt it together and go!

73's

Gary N8DMT

*Usual Disclaimer: Own no stock or interest, just a regular customer...

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173

Email: g13216@email.mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Reg Clemens [mailto:reg@dwf.com]
Sent: Tuesday, April 25, 2000 1:00 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: M12 - not ready for prime timing

In your message you said

> I use bias
> tees and power dividers to feed my units, so I had to cut the cord off the

> included antenna and put a connector on it to get to my power dividers

Is this something you built up yourself, or is it a commercial product
($$$).
I would like to split the signal coming down from the GPS antenna on my
roof,
but havent thought seriously about the problem yet.

--
                                        Reg.Clemens
                                        reg@dwf.com

You are currently subscribed to tacgps as: G13216@EMAIL1.WES.MOT.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: RICK@CNSSYS.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

57. [tacgps] Re: M12 - not ready for prime timing

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 25 Apr 2000 22:23:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80027-2000.04.25-22.27.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I use mini-circuits bias tees and power dividers. I have a Motorola Antenna
97 mounted on a pie plate with some RF absorbent material on the ground
plane. I cut the cable on the antenna so its only about 1 foot long. Then
I change over to RG-213 for a 40 foot coax run. This runs into a bias tee,
then a 2 way divider, with one leg going to a Oncore VP, the other leg going
to a 4 way divider. On the output of each divider, is another bias tee.
The first GPS, supplies the antenna power, by jumping around all the
dividers to the antenna bias tee. The remaining bias tees are terminated
with 200 ohm resistors so they will pull power and activate their antenna
ports. I have 2 Oncores VPs, 1 M12, and 2 Garmin handhelds running on this
system. The main reason I used bias tee's all the way around, is the
mini-circuits divider's are transformer coupled and I do not know how much
current they can take.

A DBS satellite splitter should work OK, too.

I attempted to make wilkinson dividers with 75 ohm coax quarter wave
sections, and it worked but I had more loss than I expected. Thats why I
went the mini-circuit route.

There are splitters allready set up for GPS, where the first port feeds the
antenna and the rest terminate in DC loads. I beleive Navtech has a 4 way,
and it was under $400 or $500.

Also, I have found some cheaper bias tee's than mini-circuits that work. A
company called Dawn Satellite sells 4 Ghz bias tees for $19. They were made
by Avantek. I do not have any test equipment to measure loss at 1.5 Ghz.

Sub'ing them for the Mini-Circuits bias tee, did not show any more loss on
the signal strengths on TAC32.

> ----------
> From: Reg Clemens[SMTP:reg@dwf.com]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, April 25, 2000 1:00 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: M12 - not ready for prime timing
>
> In your message you said
>
> > I use bias
> > tees and power dividers to feed my units, so I had to cut the cord off
> the
> > included antenna and put a connector on it to get to my power dividers
>
> Is this something you built up yourself, or is it a commercial product
> ($$$).
> I would like to split the signal coming down from the GPS antenna on my
> roof,
> but havent thought seriously about the problem yet.
>
>
> --
>   Reg.Clemens
>   reg@dwf.com
>
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

58. [tacgps] RE: Multiple Receivers -- Single Antenna

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 26 Apr 2000 07:21:12 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80078-2000.04.26-07.22.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Richard M. Hambly" wrote:
>
> For a nice package check out
> http://www.fleetpc.com/accessories/accessories.html under GPS Antenna
> Splitters. This is the new home for WR, Inc. products. I use the "Loaded DC
> Blocked Splitter 1 Input 4 Outputs" part number ALDCBS1X4 with Hi-Isolation
> option. OK, so the list price of this one is $495 + $100. The passive 1x2
> splitter, pn LDCBS1X2, is $295; the 4-way is $395.
>
> These prices are higher than other approaches but these are very nice units
> and are self-contained.

WR make nice products and have elected to specialize in GPS... at least
for now. They're a little pricey, but it depends on what you want and
need. If you're looking at good quality for lab work, they're worth a
look. If this is pure hobby, they may be out of the price zone.
--
Gerry Creager
"Due to the confusion from too many genres of music, we have decided to
put both country music and rap music into the genre of Crap music."

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59. [tacgps] Re: M12 - not ready for prime timing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 26 Apr 2000 07:57:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80083-2000.04.26-07.58.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Avantek hardware have been good in my past experiences at these
frequencies.

73, gerry

ps: MSFC, huh? I'm an STS-47/Spacelab-J alumnus, and spent more'n a
little time on your fair campus for training and mission.
--
Gerry Creager
"Due to the confusion from too many genres of music, we have decided to
put both country music and rap music into the genre of Crap music."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

60. [tacgps] RE: Multiple Receivers -- Single Antenna

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Wed, 26 Apr 2000 16:45:58 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80127-2000.04.26-11.47.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Reg Clemens asked about GPS power splitters. Let me chime in with a few
comments.

To do this job, you have to consider four different problems:
  1. Splting the L-Band RF signal.
  2. Making sure that the DC bias generated by the rcvr doesn't get
     get shorted in a way that zaps the receivers.
  3. Making sure that the proper DC bias then gets to the antenna.
  4. How much money do you want to pay?

If (4) is no problem, then your easiest solution is the one suggested by
WB2TNL -- get a splitter from WR at
http://www.fleetpc.com/accessories/accessories.html. My personal
recommendation is a 4-way HILDCBS1X4-N at $595 and then you don't need
to worry about (1), (2) or (3). The "H" High Isolation version means
that a receiver that GENERATES RFI (like happens with the geodetic
TurboRogue's first LO radiation) may not clobber other receivers in use
at the site. [Because of this RFI problem, I had to develop a ~80-90 dB
cross-port isolation splitter for my GODE IGS site, where we usually
have a half-dozen receivers running at a time.]

But if you are seeking a typical amateur (i.e. cheap bastard) solution,
then (1), (2) and (3) need to be considered.

The MiniCircuits 2- and 4-way splitters that were suggested work fine.
If you use an Ohmmeter to probe the DC response, you will find that all
the center pins on the coax connectors are connected together and there
is no continuity to ground. This means that if you put two receivers on
one of these splitters, then the bias outputs will "fight" eache other
and the receiver with the higher voltage will try to push current into
the receiver with a lower bias voltage. If you are using the new M12,
the solution is trivial -- there is a jumper on the interface board that
connects the rcvr's antenna bias to either a 5v or 3.3v source. Just
pull this jumper, and you have disconnected the M12's bias source,
leaving the MCX connector floating to DC and the two receivers won't
"fight". Since the MiniCircuits splitter has DC continuity, the other
receiver will drive the antenna preamp just fine.

Another type of splitter you may find at hamfests is a 3dB or 10 dB
Directional Coupler. The 3 dB units (also called quadrature hybrids) are
typically shaped like the letter "H". The signal from the two ports on
one side is split into the two ports on the opposite side. You will also
find that these devices have DC continuity between diagonally opposite
ports. So you put an antenna on one side, and the two rcvrs on the
opposite side, and one rcvr provides the DC bias. Now all we have to do
is to terminate the 4th port. Here I have used a 51 ohm resistor in
series with a capacitor for this. I use one of the old button mica caps
that will fit inside a type-N connector shell, with the resistor going
to the center pin. A splitter of mine just like this has been on loan to
Steve Bible (N7HPR) for some time and is what he used for the
zero-baseline testing on the TAPR DGPS module.

If you find a 6 or 10 dB couple, they work fine too. You will find that
the "thru" and "tap" sides have DC continuity. I have used terminators
similar to that I just described with such couplers on numerous
occasions.

At the hamfests, you will sometimes find a Type-N or SMA series
capacitor. These units were used to isolate both the shield and center
conductor of coax to break up DC and AC power-line noise loops. If you
find these, gobble them up -- they are great for solving your DC bias
isolation problems.

A comment was made about providing a 200-ohm DC path for the unused
port. Yes, you can do this, but I have yet to see a receiver that really
cares if the antenna has a DC path. It may REPORT that the antenna is
disconnected, but it doesn't really care. Some antennas (like the
quad-helix that Garmin uses as their flip-up antenna on handhelds) have
no preamp and no DC path anyway. If you are going to use a 200 ohm
resistor, you may as well have it drive a LED, and then you have an
indicator that the receiver is on (and current will still be drawn).

The suggestion was made about using TV hardware. I'll note that the IF
used for the K-band satellite systems (i.e. DirecTV) is 900-1500 MHz,
and much of the hardware is suitable for use at GPS's 1575 MHz
frequency, although the hardware uses 75 ohm Type-F connectors. The high
quality foam RG-6 cable works quite well for GPS, and the 75 vs 50 ohm
issue only means you are fighting a 1.5:1 VSWR on the cable and taking a
couple of tenths of a dB loss from it. Since the DSS TV dishes have
their power supplied thru the coax, the DSS power splitters have at
least addressed the DC issues. But I advise you use an ohmmeter in the
SALT Treaty "Trust but Verify" mode. Try the TV parts -- they are cheap!

Hope these ideas helped -- 73, Tom

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61. [tacgps] RE: Multiple Receivers -- Single Antenna

From: Dave Martindale <davem@cs.ubc.ca>
Date: Wed, 26 Apr 2000 10:07:23 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80129-2000.04.26-12.06.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>A comment was made about providing a 200-ohm DC path for the unused
>port. Yes, you can do this, but I have yet to see a receiver that really
>cares if the antenna has a DC path. It may REPORT that the antenna is
>disconnected, but it doesn't really care. Some antennas (like the
>quad-helix that Garmin uses as their flip-up antenna on handhelds) have
>no preamp and no DC path anyway.

There is at least one type of receiver that DOES need current drawn
from its antenna jack. The Garmin 12XL has an internal patch antenna
plus an external antenna jack. Internal circuitry senses the current
drawn from the antenna jack by the external antenna and switches the RF
input from the internal antenna to the external antenna. If you plug in
a passive external antenna, or the DC-blocked output of a splitter,
the GPS continues to use the internal patch antenna - it doesn't know
that it has an external signal source. That's why the DC load is needed
on the ports that don't power the antenna.

The Garmin eMap uses the same arrangement of internal antenna plus
external antenna jack, so it probably also needs the same load.
The Garmin receivers with external antennas don't need the load, since
they don't do any antenna switching internally - they just take whatever
signal comes in the antenna jack.

        Dave

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62. [tacgps] RE:Single Antenna Multiple Receivers

From: Jim Korenz <n8pxw@yahoo.com>
Date: Wed, 26 Apr 2000 13:17:42 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-80147-2000.04.26-15.19.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi All,
   I have been using the RCA DSS splitter model D800 from Radio Shack. The freq range is listed as 40-2150 MHz and it includes the steering diodes to power the GPS antenna. I think it costs about $12. It has 3 "F" connectors and is 75 ohms, but I use 3 BNC to "F" adapters and have had no problems. I have the older Motorola "hockey puck" antenna with about 30 feet of RG-58 through the basement window. I have run a VP as the DGPS ref station and have used a VP, GPS III, and Magellan XL as rovers. The only problem with this arrangement is that the highest voltage will power the antenna. If your receiver senses current, none of mine did, it may complain.
   Jim Korenz   N8PXW

_____
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Send online invitations with Yahoo! Invites.
http://invites.yahoo.com

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May 2000

Original source file: tacgps.0005
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0005

1. [tacgps] SA going away at midnight??

From: Brooks Shera <ebs@lanl.gov>
Date: Mon, 1 May 2000 08:52:16 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81032-2000.05.01-09.55.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The Wall Street Journal says that the gov't is expected to announce today
that SA will be turned off as of midnight tonight. Anyone else hear
anything about this remarkable development?

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2. [tacgps] Re: SA going away at midnight??

From: Ray Vaughan <ray@rayvaughan.com>
Date: Mon, 01 May 2000 11:20:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81041-2000.05.01-10.21.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 08:52 AM 5/1/00 -0700, you wrote:
>The Wall Street Journal says that the gov't is expected to announce today
>that SA will be turned off as of midnight tonight. Anyone else hear
>anything about this remarkable development?

About a week ago I read an article about how the Administration wants now to speed things up. One of the driving forces is that the French is about to roll out a system that's much more accurate and it could mean we would lose business. The current goal was 2006, but they wanted to speed things up. To turn it all totally would really surprise me. I'd love it, but I would still be surprised. I'm sure the Military and national security guys would veto that real fast.

Ray J. Vaughan, MS, CBTE, CERT
KD4BBM PG-7-15266
ray@rayvaughan.com
ray@2-way.com
http://www.rayvaughan.com/

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3. [tacgps] Re: SA going away at midnight??

From: Bob Smallwood <smallwood@technologist.com>
Date: Mon, 01 May 2000 12:12:17 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81048-2000.05.01-11.13.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

That WOULD be good news...

I have found no "newswire" references to it at the wsj website, or AP,
Washington Post, etc... does the WSJ article mention a "source" for that info?

Bob Smallwood

At 11:52 AM 05/01/2000, you wrote:
>The Wall Street Journal says that the gov't is expected to announce today
>that SA will be turned off as of midnight tonight. Anyone else hear
>anything about this remarkable development?

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4. [tacgps] Re: SA going away at midnight??

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Mon, 01 May 2000 16:14:11 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81049-2000.05.01-11.15.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Here is a copy of the White House press release announcing this:

[available at http://www.whitehouse.gov/library/PressReleases.cgi]

May 1, 2000

STATEMENT BY THE PRESIDENT REGARDING THE UNITED STATES' DECISION
TO STOP DEGRADING GLOBAL POSITIONING SYSTEM ACCURACY

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release May 1, 2000

STATEMENT BY THE PRESIDENT REGARDING
THE UNITED STATES' DECISION TO STOP DEGRADING
GLOBAL POSITIONING SYSTEM ACCURACY

Today, I am pleased to announce that the United States will stop the intentional degradation of the Global Positioning System (GPS) signals available to the public beginning at midnight tonight. We call this degradation feature Selective Availability (SA). This will mean that civilian users of GPS will be able to pinpoint locations up to ten times more accurately than they do now. GPS is a dual-use, satellite-based system that provides accurate location and timing data to users worldwide.
My March 1996 Presidential Decision Directive included in the goals for GPS
to: "encourage acceptance and integration of GPS into peaceful civil, commercial and scientific applications worldwide; and to encourage private
sector investment in and use of U.S. GPS technologies and services." To meet these goals, I committed the U.S. to discontinuing the use of SA by 2006 with an annual assessment of its continued use beginning this year.

The decision to discontinue SA is the latest measure in an on-going effort
to make GPS more responsive to civil and commercial users worldwide. Last
year, Vice President Gore announced our plans to modernize GPS by adding two new civilian signals to enhance the civil and commercial service. This
initiative is on-track and the budget further advances modernization by incorporating some of the new features on up to 18 additional satellites that are already awaiting launch or are in production. We will continue to
provide all of these capabilities to worldwide users free of charge.

My decision to discontinue SA was based upon a recommendation by the Secretary of Defense in coordination with the Departments of State, Transportation, Commerce, the Director of Central Intelligence, and other
Executive Branch Departments and Agencies. They realized that worldwide transportation safety, scientific, and commercial interests could best be
served by discontinuation of SA. Along with our commitment to enhance GPS
for peaceful applications, my administration is committed to preserving fully the military utility of GPS. The decision to discontinue SA is coupled with our continuing efforts to upgrade the military utility of our
systems that use GPS, and is supported by threat assessments which conclude
that setting SA to zero at this time would have minimal impact on national
security. Additionally, we have demonstrated the capability to selectively
deny GPS signals on a regional basis when our national security is

threatened. This regional approach to denying navigation services is
consistent with the 1996 plan to discontinue the degradation of civil
and
commercial GPS service globally through the SA technique.

Originally developed by the Department of Defense as a military system,
GPS
has become a global utility. It benefits users around the world in many
different applications, including air, road, marine, and rail
navigation,
telecommunications, emergency response, oil exploration, mining, and
many
more. Civilian users will realize a dramatic improvement in GPS
accuracy
with the discontinuation of SA. For example, emergency teams responding
to
a cry for help can now determine what side of the highway they must
respond
to, thereby saving precious minutes. This increase in accuracy will
allow
new GPS applications to emerge and continue to enhance the lives of
people
around the world.

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5. [tacgps] Re: SA going away at midnight??

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Mon, 1 May 2000 12:19:20 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81052-2000.05.01-11.20.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Try:
http://www.whitehouse.gov/library/PressReleases.cgi?date=0&briefing=0

>That WOULD be good news...
>
>I have found no "newswire" references to it at the wsj website, or AP,
>Washington Post, etc... does the WSJ article mention a "source" for that
>info?
>
>Bob Smallwood
>
>
>
>At 11:52 AM 05/01/2000, you wrote:
>>The Wall Street Journal says that the gov't is expected to announce today
>>that SA will be turned off as of midnight tonight. Anyone else hear
>>anything about this remarkable development?
>
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re: SA going away at midnight??

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Mon, 1 May 2000 11:26:12 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81056-2000.05.01-11.43.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I claim credit for this since I just received my TAPR DGPS station and was
getting ready to put it on the air tonight! :o)

Great News!!!

73's

Gary N8DMT

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email.mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Dr Thomas A Clark [mailto:clark@tomcat.gsfc.nasa.gov]
Sent: Monday, May 01, 2000 11:14 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: SA going away at midnight??

Here is a copy of the White House press release announcing this:

[available at http://www.whitehouse.gov/library/PressReleases.cgi]

<snip>

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7. [tacgps] Re: SA going away at midnight??

From: Ray Vaughan <ray@rayvaughan.com>
Date: Mon, 01 May 2000 12:46:54 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81057-2000.05.01-11.48.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I had to see it for myself. Blurb on page 1, the rest of the story on A36. Basically, since the military can now jam GPS in a focused area, they don't have to worry about being used against us.

"WASHINGTON - The Clinton administration has decided to make military-quality signals available to civilian and commercial users of the satellite based Global Positioning System.

"The decision, which is expected to be announced today and go into effect by midnight tonight, will mean a fivefold or tenfold increase in the accuracy of satellite based navigation systems used by a range of consumers from commercial truckers and shippers fishermen, hikers, surveyors and emergency-response systems." [...] (Wall Street Journal, 5/1/00, Page A36)

They go on to mention it being needed for cellular E911 and that the military can jam GPS if needed.

"After an extensive review, the military and intelligence community decided that we could" improve the civilian signal's quality "without posing any threat to national security" one US official said." (ibid)

Sounds like it's party time!

At 12:12 PM 5/1/00 -0400, you wrote:
>That WOULD be good news...
>
>I have found no "newswire" references to it at the wsj website, or AP, Washington Post, etc... does the WSJ article mention a "source" for that info?
>
>Bob Smallwood
>
>
>
>At 11:52 AM 05/01/2000, you wrote:
>>The Wall Street Journal says that the gov't is expected to announce today
>>that SA will be turned off as of midnight tonight. Anyone else hear
>>anything about this remarkable development?

Ray J. Vaughan, MS, CBTE, CERT
KD4BBM PG-7-15266
ray@rayvaughan.com
ray@2-way.com
http://www.rayvaughan.com/

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8. [tacgps] More on GPS S/A Going Away

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Mon, 01 May 2000 16:53:46 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR APRS SIG <aprssig@lists.tapr.org>, AMSAT BB <amsat-bb@amsat.org>
Message-ID: <LYR6754-81060-2000.05.01-11.55.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In addition to the White House posting available at

   http://www.whitehouse.gov/library/PressReleases.cgi

I refer you to the material posted on the IGEB (Interagency GPS
Executive Board) Web Site. Most of this material is "embargoed"
until 14:00 EDT today (and it's not yet 13:00!), but since the
cat is out of the bag, you may as well read all the details at

   http://www.igeb.gov/

Note especially the text in the DOC Fact Sheet.

Regards, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] Re: [amsat-bb] More on GPS S/A Going Away

From: Doug Faunt N6TQS +1-510-655-8604 <faunt@netcom.com>
Date: Mon, 1 May 2000 10:34:00 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81065-2000.05.01-12.35.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For a wild takeoff from the actual subject, I'm amaused to see that
the end of the text is signaled by "30", another use of the
telegraphers code that gave us 73 and 88.

73, doug

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Re: More on GPS S/A Going Away

From: "Paul J. Beckmann" <paul@eye.psych.umn.edu>
Date: Mon, 1 May 2000 12:40:34 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81068-2000.05.01-12.43.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

So, Tom and others---
  Is there any use for DGPS without SA? I just ordered my kit but I
can still have time to cancel!
--Paul

Paul Beckmann -- WA0RSE 1882 South Lane wa0rse@amsat.org
ARRL/NLRS Mendota Heights, MN cell:612-414-0302
AMSAT #26957 55118-4328 fax:651-452-4103

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] Re: SA going away at midnight??

From: Dave Martindale <davem@cs.ubc.ca>
Date: Mon, 01 May 2000 10:46:27 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81071-2000.05.01-12.46.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 11:26 AM 01/05/00 -0500, you wrote:
>I claim credit for this since I just received my TAPR DGPS station and was
>getting ready to put it on the air tonight! :o)

Of course, your DGPS station is still useful.

Today, with SA on, your receiver without DGPS will tell you which parking
lot your car is in.

Tomorrow, with SA off, your receiver will tell you which row of cars in
that parking lot contains your car, and even where you are in the row
plus or minus a few cars.

Today or tomorrow, DGPS will find your car and your car alone. So you
don't need to remember what it looks like. :-)

        Dave

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Re: [amsat-bb] More on GPS S/A Going Away

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Mon, 1 May 2000 11:57:24 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81082-2000.05.01-13.58.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> For a wild takeoff from the actual subject, I'm amaused to see that
> the end of the text is signaled by "30", another use of the
> telegraphers code that gave us 73 and 88.

Correct me if I am wrong, but in addition to being a telegrapher's
code, isn't 30 the decimal code for the ascii <CR> or <LF>?

73s,
Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: More on GPS S/A Going Away

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Mon, 01 May 2000 18:53:56 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81080-2000.05.01-13.57.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Paul asked:
>
> So, Tom and others---
>   Is there any use for DGPS without SA? I just ordered my kit but I
> can still have time to cancel!
> --Paul

Removing S/A will improve the 100ish meter excursions you see today down
to about 25m.

DGPS applied when S/A is active takes the 100ish meters down to < 10
meters and should take the non-S/A 25m down to about 5m.

Your handheld now shows a speed of 1-2 mph when you are stopped. When
S/A is turned off, it will go down to 0.1-0.2 mph. With DGPS it shows
zero.

The 100-200 nsec pk-to-pk clock excursions (which I was able to average
out in the time domain to ~20 nsec with the "tricks" in the TAC) should
go down to 50 nsec, averaging down to ~10 nsec.

The parking lot vs row vs location analogy from Dave Martindale was
quite good.

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: More on GPS S/A Going Away

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 01 May 2000 14:00:32 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81088-2000.05.01-14.04.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Paul J. Beckmann" wrote:
>
> So, Tom and others---
> Is there any use for DGPS without SA? I just ordered my kit but I
> can still have time to cancel!

YES depending on the results you want/need. You will get nominally a 29m accuracy (2d rms == horizontal) and more'r'less 56m vertical accuracy with SA completely off... it can still be spot worse, or better. You should appreciate an order-of- magnitude improvement with good DGPS based on a well- and accurately surveyed antenna.

Neither of these (autonomous, or code-phase DGPS) is good enough for formal geodetic research or surveying, but will make most GIS folken and cartographers grin.

73, gerry n5jxs
--
Gerry Creager
"Due to the confusion from too many genres of music, we have decided to put both country music and rap music into the genre of Crap music."

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: [amsat-bb] More on GPS S/A Going Away

From: "Expressmailbc" <bcampbell@scettc.org>
Date: Mon, 1 May 2000 15:16:44 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81093-2000.05.01-14.18.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

-30- was also used for many years at the end of a news release to signal the end of the story. It was particularly important in the earlier days of newspapers and linotype operations because a multipage release sometimes became separated and it was the -30- that told the operator it was the end of the release or story.
Barry Campbell
W2CGX in New Jersey

> -----Original Message-----
> From: bounce-tacgps-5572@lists.tapr.org
> [mailto:bounce-tacgps-5572@lists.tapr.org]On Behalf Of Jeffrey Pawlan
> Sent: Monday, May 01, 2000 2:57 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: [amsat-bb] More on GPS S/A Going Away
>
>
> > For a wild takeoff from the actual subject, I'm amaused to see that
> > the end of the text is signaled by "30", another use of the
> > telegraphers code that gave us 73 and 88.
>
> Correct me if I am wrong, but in addition to being a telegrapher's
> code, isn't 30 the decimal code for the ascii <CR> or <LF>?
>
> 73s,
> Jeffrey Pawlan, WA6KBL
>
>
>
> ---
> You are currently subscribed to tacgps as: BARRYC@COMPUBELL.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: What next ???

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Mon, 1 May 2000 22:09:00 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81212-2000.05.01-22.11.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Okay Gary ... what are you building next ??

We won't talk about the high speed CW decoder
you were building last year .... :-)

I just want to be prepared for the next change !

G. Beat
w9gb

----- Original Message -----
From: "Mastenbrook Gary-G13216" <Gary.Mastenbrook@motorola.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, May 01, 2000 11:26 AM
Subject: [tacgps] Re: SA going away at midnight??

> I claim credit for this since I just received my TAPR DGPS station and was
> getting ready to put it on the air tonight! :o)
>
> Great News!!!
>
> 73's
>
> Gary N8DMT
>
> Gary Mastenbrook, Product Visioneering, Motorola, Inc.
> 50 E. Commerce Drive, Schaumburg, IL 60173
> Email: g13216@email.mot.com
> Work Home Page: http://www.mot.com/telematics
> Personal Home Page: http://www.qsl.net/n8dmt
>
>
> -----Original Message-----
> From: Dr Thomas A Clark [mailto:clark@tomcat.gsfc.nasa.gov]
> Sent: Monday, May 01, 2000 11:14 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: SA going away at midnight??
>
>
> Here is a copy of the White House press release announcing this:
>
>
> [available at http://www.whitehouse.gov/library/PressReleases.cgi]
>
> <snip>
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: [amsat-bb] More on GPS S/A Going Away

From: Kohjin Yamada <kohjin@marina.prug.or.jp>
Date: Tue, 02 May 2000 18:21:47 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR APRS SIG <aprssig@lists.tapr.org>, AMSAT BB <amsat-bb@AMSAT.Org>
Message-ID: <LYR6754-81252-2000.05.02-04.26.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

SA set off at around 09:00 UTC May 2 !!!

I'm watching TAC32 shows the height stays within 1m now, big surprise.

Kohjin - JR1EDE

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] RE: More on GPS S/A Going Away

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 2 May 2000 07:19:53 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81262-2000.05.02-06.21.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

All,

I wrote a special version of Tac32Plus yesterday specifically to capture this event. The receiver used in this test was a Motorola M12 Version 1.3.

The following data is extracted from a log that stores every significant change in satellite status (NOT Azimuth, Elevation, SNR). Because of this most of the entries show the events during signal acquisition and loss of signal. Once the satellite is being tracked only the occasional parity error is logged. EXCEPT for the change in SA state around 08:00 UTC!

The following data is from a two hour period from 07:00 UTC to 09:00 UTC. At 07:59:50 things begin to happen all at once.

Rick WB2TNL
==========
36648.291285 (Tue May 02, 2000 06:59:27 UTC) Sat PRN 6, El 20, Azm 71, SNR 14, AS, SA
36648.292373 (Tue May 02, 2000 07:01:01 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Available
36648.292419 (Tue May 02, 2000 07:01:05 UTC) Sat PRN 6, El 20, Azm 71, SNR 12, AS, SA
36648.292593 (Tue May 02, 2000 07:01:20 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Available
36648.292616 (Tue May 02, 2000 07:01:22 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Message Sync Detect
36648.292628 (Tue May 02, 2000 07:01:23 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Code Search
36648.294237 (Tue May 02, 2000 07:03:42 UTC) Sat PRN 6, El 20, Azm 69, SNR 0, Freq Acquire
36648.294260 (Tue May 02, 2000 07:03:44 UTC) Sat PRN 6, El 20, Azm 69, SNR 12, AS, SA
36648.294341 (Tue May 02, 2000 07:03:51 UTC) Sat PRN 6, El 20, Azm 69, SNR 21, AS, SA, Parity Error
36648.294399 (Tue May 02, 2000 07:03:56 UTC) Sat PRN 6, El 20, Azm 69, SNR 19, AS, SA
36648.296829 (Tue May 02, 2000 07:07:26 UTC) Sat PRN 29, El 19, Azm 127, SNR 10, AS, SA, Parity Error
36648.296841 (Tue May 02, 2000 07:07:27 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Available
36648.296852 (Tue May 02, 2000 07:07:28 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Message Sync Detect
36648.296875 (Tue May 02, 2000 07:07:30 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Code Search
36648.297373 (Tue May 02, 2000 07:08:13 UTC) Sat PRN 29, El 18, Azm 127, SNR 0, Freq Acquire
36648.297419 (Tue May 02, 2000 07:08:17 UTC) Sat PRN 29, El 18, Azm 127, SNR 0, Code Search
36648.297454 (Tue May 02, 2000 07:08:20 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Freq Acquire
36648.297466 (Tue May 02, 2000 07:08:21 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Message Sync Detect
36648.297477 (Tue May 02, 2000 07:08:22 UTC) Sat PRN 29, El 19, Azm 127, SNR 22, AS, SA
36648.297709 (Tue May 02, 2000 07:08:42 UTC) Sat PRN 6, El 20, Azm 67, SNR 10, AS, SA, Parity Error
36648.297744 (Tue May 02, 2000 07:08:45 UTC) Sat PRN 6, El 20, Azm 67, SNR 9, AS, SA
36648.297767 (Tue May 02, 2000 07:08:47 UTC) Sat PRN 6, El 20, Azm 67, SNR 12, AS, SA, Parity Error
36648.297813 (Tue May 02, 2000 07:08:51 UTC) Sat PRN 6, El 20, Azm 67, SNR 11, AS, SA
36648.298033 (Tue May 02, 2000 07:09:10 UTC) Sat PRN 6, El 20, Azm 67, SNR 10, AS, SA, Parity Error

```
36648.298044  (Tue May 02, 2000 07:09:11 UTC) Sat PRN 6, El 20, Azm 67, SNR 0,
Available
36648.298102  (Tue May 02, 2000 07:09:16 UTC) Sat PRN 6, El 20, Azm 67, SNR 0,
Message Sync Detect
36648.298149  (Tue May 02, 2000 07:09:20 UTC) Sat PRN 6, El 20, Azm 67, SNR
12, AS, SA
36648.298207  (Tue May 02, 2000 07:09:25 UTC) Sat PRN 6, El 20, Azm 67, SNR 0,
Available
36648.298218  (Tue May 02, 2000 07:09:26 UTC) Sat PRN 6, El 20, Azm 67, SNR 0,
Message Sync Detect
36648.298241  (Tue May 02, 2000 07:09:28 UTC) Sat PRN 6, El 20, Azm 67, SNR 0,
Code Search
36648.298785  (Tue May 02, 2000 07:10:15 UTC) Sat PRN 6, El 20, Azm 66, SNR 0,
Freq Acquire
36648.298820  (Tue May 02, 2000 07:10:18 UTC) Sat PRN 6, El 20, Azm 66, SNR
15, AS, SA
36648.299028  (Tue May 02, 2000 07:10:36 UTC) Sat PRN 6, El 20, Azm 66, SNR 0,
Available
36648.299040  (Tue May 02, 2000 07:10:37 UTC) Sat PRN 6, El 20, Azm 66, SNR
11, AS, SA, Parity Error
36648.299075  (Tue May 02, 2000 07:10:40 UTC) Sat PRN 6, El 20, Azm 66, SNR
12, AS, SA
36648.300753  (Tue May 02, 2000 07:13:05 UTC) Sat PRN 30, El 9, Azm 43, SNR
14, AS, SA, Parity Error
36648.300788  (Tue May 02, 2000 07:13:08 UTC) Sat PRN 30, El 9, Azm 43, SNR
14, AS, SA
36648.306586  (Tue May 02, 2000 07:21:29 UTC) Sat PRN 29, El 13, Azm 131, SNR
12, AS, SA, Parity Error
36648.306609  (Tue May 02, 2000 07:21:31 UTC) Sat PRN 29, El 13, Azm 131, SNR
0, Available
36648.306644  (Tue May 02, 2000 07:21:34 UTC) Sat PRN 6, El 20, Azm 61, SNR
11, AS, SA, Parity Error
36648.306644  (Tue May 02, 2000 07:21:34 UTC) Sat PRN 29, El 13, Azm 131, SNR
0, Code Search
36648.306679  (Tue May 02, 2000 07:21:37 UTC) Sat PRN 6, El 20, Azm 61, SNR
13, AS, SA
36648.306980  (Tue May 02, 2000 07:22:03 UTC) Sat PRN 3, El 0, Azm 0, SNR 0,
Code Search
36648.307385  (Tue May 02, 2000 07:22:38 UTC) Sat PRN 29, El 13, Azm 131, SNR
0, Freq Acquire
36648.307431  (Tue May 02, 2000 07:22:42 UTC) Sat PRN 29, El 13, Azm 131, SNR
0, Code Search
36648.307477  (Tue May 02, 2000 07:22:46 UTC) Sat PRN 29, El 13, Azm 131, SNR
0, Freq Acquire
36648.307489  (Tue May 02, 2000 07:22:47 UTC) Sat PRN 29, El 13, Azm 131, SNR
13, AS, SA
36648.308102  (Tue May 02, 2000 07:23:40 UTC) Sat PRN 30, El 5, Azm 43, SNR
14, AS, SA, Parity Error
36648.308137  (Tue May 02, 2000 07:23:43 UTC) Sat PRN 30, El 5, Azm 44, SNR
13, AS, SA
36648.308183  (Tue May 02, 2000 07:23:47 UTC) Sat PRN 30, El 5, Azm 44, SNR
12, AS, SA, Parity Error
36648.308218  (Tue May 02, 2000 07:23:50 UTC) Sat PRN 30, El 5, Azm 44, SNR 0,
Available
36648.308264  (Tue May 02, 2000 07:23:54 UTC) Sat PRN 30, El 5, Azm 44, SNR 0,
Code Search
36648.308345  (Tue May 02, 2000 07:24:01 UTC) Sat PRN 30 no longer in use
36648.309630  (Tue May 02, 2000 07:25:52 UTC) Sat PRN 6, El 20, Azm 59, SNR
12, AS, SA, Parity Error
36648.309711  (Tue May 02, 2000 07:25:59 UTC) Sat PRN 6, El 20, Azm 59, SNR
14, AS, SA
36648.310406  (Tue May 02, 2000 07:26:59 UTC) Sat PRN 29, El 11, Azm 132, SNR
0, Available
36648.310440  (Tue May 02, 2000 07:27:02 UTC) Sat PRN 29, El 11, Azm 132, SNR
0, Code Search
36648.313855  (Tue May 02, 2000 07:31:57 UTC) Sat PRN 29, El 9, Azm 133, SNR
0, Freq Acquire
36648.313901  (Tue May 02, 2000 07:32:01 UTC) Sat PRN 29, El 9, Azm 133, SNR
0, Code Search
36648.315521  (Tue May 02, 2000 07:34:21 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Freq Acquire
36648.315568  (Tue May 02, 2000 07:34:25 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Code Search
36648.315602  (Tue May 02, 2000 07:34:28 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Message Sync Detect
36648.315649  (Tue May 02, 2000 07:34:32 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Ephemeris Acquire
36648.315950  (Tue May 02, 2000 07:34:58 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Message Sync Detect
```

```
36648.315984  (Tue May 02, 2000 07:35:01 UTC) Sat PRN 3, El 9, Azm 169, SNR 0,
Code Search
36648.317605  (Tue May 02, 2000 07:37:21 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Freq Acquire
36648.317651  (Tue May 02, 2000 07:37:25 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Code Search
36648.317744  (Tue May 02, 2000 07:37:33 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Freq Acquire
36648.317790  (Tue May 02, 2000 07:37:37 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Code Search
36648.318010  (Tue May 02, 2000 07:37:56 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Freq Acquire
36648.318021  (Tue May 02, 2000 07:37:57 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Message Sync Detect
36648.318079  (Tue May 02, 2000 07:38:02 UTC) Sat PRN 3, El 10, Azm 169, SNR
0, Ephemeris Acquire
36648.318426  (Tue May 02, 2000 07:38:32 UTC) Sat PRN 3, El 11, Azm 169, SNR
19, AS, SA
36648.318982  (Tue May 02, 2000 07:39:20 UTC) Sat PRN 6, El 19, Azm 54, SNR 0,
Available
36648.318994  (Tue May 02, 2000 07:39:21 UTC) Sat PRN 6, El 19, Azm 54, SNR 0,
Message Sync Detect
36648.319028  (Tue May 02, 2000 07:39:24 UTC) Sat PRN 6, El 19, Azm 54, SNR 0,
Code Search
36648.319503  (Tue May 02, 2000 07:40:05 UTC) Sat PRN 6, El 19, Azm 53, SNR 0,
Freq Acquire
36648.319514  (Tue May 02, 2000 07:40:06 UTC) Sat PRN 6, El 19, Azm 53, SNR
14, AS, SA
36648.322547  (Tue May 02, 2000 07:44:28 UTC) Sat PRN 29 no longer in use
36648.323276  (Tue May 02, 2000 07:45:31 UTC) Sat PRN 3, El 13, Azm 167, SNR
12, AS, SA, Parity Error
36648.323311  (Tue May 02, 2000 07:45:34 UTC) Sat PRN 3, El 13, Azm 167, SNR
13, AS, SA
36648.323658  (Tue May 02, 2000 07:46:04 UTC) Sat PRN 3, El 13, Azm 167, SNR
0, Available
36648.323785  (Tue May 02, 2000 07:46:15 UTC) Sat PRN 3, El 14, Azm 167, SNR
0, Code Search
36648.325625  (Tue May 02, 2000 07:48:54 UTC) Sat PRN 19, El 0, Azm 0, SNR 0,
Code Search
36648.325811  (Tue May 02, 2000 07:49:10 UTC) Sat PRN 19 no longer in use
36648.325973  (Tue May 02, 2000 07:49:24 UTC) Sat PRN 19, El 0, Azm 0, SNR 0,
Code Search
36648.326100  (Tue May 02, 2000 07:49:35 UTC) Sat PRN 3, El 15, Azm 167, SNR
0, Freq Acquire
36648.326146  (Tue May 02, 2000 07:49:39 UTC) Sat PRN 3, El 15, Azm 167, SNR
0, Code Search
36648.326713  (Tue May 02, 2000 07:50:28 UTC) Sat PRN 6, El 17, Azm 49, SNR
14, AS, SA, Parity Error
36648.326783  (Tue May 02, 2000 07:50:34 UTC) Sat PRN 6, El 17, Azm 49, SNR
15, AS, SA
36648.327686  (Tue May 02, 2000 07:51:52 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Freq Acquire
36648.327732  (Tue May 02, 2000 07:51:56 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Code Search
36648.327767  (Tue May 02, 2000 07:51:59 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Freq Acquire
36648.327813  (Tue May 02, 2000 07:52:03 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Code Search
36648.328079  (Tue May 02, 2000 07:52:26 UTC) Sat PRN 6, El 17, Azm 48, SNR 0,
Available
36648.328149  (Tue May 02, 2000 07:52:32 UTC) Sat PRN 6, El 17, Azm 48, SNR 0,
Message Sync Detect
36648.328160  (Tue May 02, 2000 07:52:33 UTC) Sat PRN 6, El 17, Azm 48, SNR 0,
Code Search
36648.328739  (Tue May 02, 2000 07:53:23 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Freq Acquire
36648.328762  (Tue May 02, 2000 07:53:25 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Message Sync Detect
36648.328774  (Tue May 02, 2000 07:53:26 UTC) Sat PRN 6, El 17, Azm 48, SNR 0,
Freq Acquire
36648.328785  (Tue May 02, 2000 07:53:27 UTC) Sat PRN 6, El 17, Azm 48, SNR
14, AS, SA
36648.328797  (Tue May 02, 2000 07:53:28 UTC) Sat PRN 6, El 17, Azm 48, SNR
20, AS, SA, Parity Error
36648.328843  (Tue May 02, 2000 07:53:32 UTC) Sat PRN 3, El 16, Azm 166, SNR
0, Available
36648.328843  (Tue May 02, 2000 07:53:32 UTC) Sat PRN 6, El 17, Azm 48, SNR
19, AS, SA
36648.328855  (Tue May 02, 2000 07:53:33 UTC) Sat PRN 3, El 16, Azm 166, SNR
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17, AS, SA
36648.330718  (Tue May 02, 2000 07:56:14 UTC) Sat PRN 3, El 17, Azm 166, SNR
11, AS, SA, Parity Error
36648.330741  (Tue May 02, 2000 07:56:16 UTC) Sat PRN 3, El 17, Azm 166, SNR
0, Available
36648.330764  (Tue May 02, 2000 07:56:18 UTC) Sat PRN 3, El 17, Azm 166, SNR
0, Message Sync Detect
36648.330788  (Tue May 02, 2000 07:56:20 UTC) Sat PRN 3, El 17, Azm 166, SNR
12, AS, SA
36648.331540  (Tue May 02, 2000 07:57:25 UTC) Sat PRN 6, El 16, Azm 47, SNR
11, AS, SA, Parity Error
36648.331563  (Tue May 02, 2000 07:57:27 UTC) Sat PRN 6, El 16, Azm 47, SNR 0,
Available
36648.331575  (Tue May 02, 2000 07:57:28 UTC) Sat PRN 6, El 16, Azm 47, SNR 0,
Message Sync Detect
36648.331598  (Tue May 02, 2000 07:57:30 UTC) Sat PRN 6, El 16, Azm 47, SNR 0,
Code Search
36648.332153  (Tue May 02, 2000 07:58:18 UTC) Sat PRN 6, El 16, Azm 46, SNR 0,
Freq Acquire
36648.332200  (Tue May 02, 2000 07:58:22 UTC) Sat PRN 6, El 16, Azm 46, SNR 0,
Code Search
36648.332281  (Tue May 02, 2000 07:58:29 UTC) Sat PRN 3, El 18, Azm 165, SNR
13, AS, SA, Parity Error
36648.332315  (Tue May 02, 2000 07:58:32 UTC) Sat PRN 3, El 18, Azm 165, SNR
12, AS, SA
36648.332338  (Tue May 02, 2000 07:58:34 UTC) Sat PRN 3, El 18, Azm 165, SNR
11, AS, SA, Parity Error
36648.332373  (Tue May 02, 2000 07:58:37 UTC) Sat PRN 3, El 18, Azm 165, SNR
10, AS, SA
36648.332385  (Tue May 02, 2000 07:58:38 UTC) Sat PRN 3, El 18, Azm 165, SNR
12, AS, SA, Parity Error
36648.332454  (Tue May 02, 2000 07:58:44 UTC) Sat PRN 3, El 18, Azm 165, SNR
10, AS, SA
36648.332500  (Tue May 02, 2000 07:58:48 UTC) Sat PRN 3, El 18, Azm 165, SNR
12, AS, SA, Parity Error
36648.332535  (Tue May 02, 2000 07:58:51 UTC) Sat PRN 3, El 18, Azm 165, SNR
14, AS, SA
36648.332906  (Tue May 02, 2000 07:59:23 UTC) Sat PRN 18, El 0, Azm 0, SNR 0,
Code Search
***
*** THIS IS IT!! - Sats 1,3,16,22,25 switch all at once.
***
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 1, El 41, Azm 312, SNR
25, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 3, El 19, Azm 165, SNR
20, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 16, El 28, Azm 294, SNR
22, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 22, El 79, Azm 223, SNR
29, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 25, El 46, Azm 72, SNR
30, AS
*** Acqusition of Sat 6 - NO SA!
36648.333750  (Tue May 02, 2000 08:00:36 UTC) Sat PRN 6, El 15, Azm 46, SNR 0,
Freq Acquire
36648.333774  (Tue May 02, 2000 08:00:38 UTC) Sat PRN 6, El 15, Azm 45, SNR 0,
Message Sync Detect
36648.333797  (Tue May 02, 2000 08:00:40 UTC) Sat PRN 6, El 15, Azm 45, SNR 0,
Code Search
36648.333832  (Tue May 02, 2000 08:00:43 UTC) Sat PRN 6, El 15, Azm 45, SNR
11, AS, SA
36648.333855  (Tue May 02, 2000 08:00:45 UTC) Sat PRN 6, El 15, Azm 45, SNR
18, AS, SA, Parity Error
36648.333913  (Tue May 02, 2000 08:00:50 UTC) Sat PRN 6, El 15, Azm 45, SNR
18, AS
36648.334364  (Tue May 02, 2000 08:01:29 UTC) Sat PRN 6, El 15, Azm 45, SNR
13, AS, Parity Error
36648.334422  (Tue May 02, 2000 08:01:34 UTC) Sat PRN 6, El 15, Azm 45, SNR
14, AS
***
*** Acqusition of Sats 18 and 19 - takes a while before we get a good signal
*** (see 08:05:08 and 08:06:08) but when we do there is NO SA!
***
36648.334723  (Tue May 02, 2000 08:02:00 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Freq Acquire
36648.334769  (Tue May 02, 2000 08:02:04 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Code Search
36648.334792  (Tue May 02, 2000 08:02:06 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Freq Acquire
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36648.334838  (Tue May 02, 2000 08:02:10 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Code Search
36648.335047  (Tue May 02, 2000 08:02:28 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Freq Acquire
36648.335093  (Tue May 02, 2000 08:02:32 UTC) Sat PRN 19, El 8, Azm 281, SNR
0, Code Search
36648.335301  (Tue May 02, 2000 08:02:50 UTC) Sat PRN 18, El 6, Azm 315, SNR
0, Freq Acquire
36648.335348  (Tue May 02, 2000 08:02:54 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Code Search
36648.335533  (Tue May 02, 2000 08:03:10 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Freq Acquire
36648.335579  (Tue May 02, 2000 08:03:14 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Code Search
36648.335625  (Tue May 02, 2000 08:03:18 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Freq Acquire
36648.335672  (Tue May 02, 2000 08:03:22 UTC) Sat PRN 18, El 6, Azm 315, SNR
0, Code Search
36648.336169  (Tue May 02, 2000 08:04:05 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Freq Acquire
36648.336216  (Tue May 02, 2000 08:04:09 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Code Search
36648.336239  (Tue May 02, 2000 08:04:11 UTC) Sat PRN 6, El 15, Azm 44, SNR
11, AS, Parity Error
36648.336239  (Tue May 02, 2000 08:04:11 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Freq Acquire
36648.336274  (Tue May 02, 2000 08:04:14 UTC) Sat PRN 6, El 15, Azm 44, SNR
14, AS
36648.336285  (Tue May 02, 2000 08:04:15 UTC) Sat PRN 18, El 6, Azm 316, SNR
0, Code Search
36648.336343  (Tue May 02, 2000 08:04:20 UTC) Sat PRN 6, El 15, Azm 44, SNR
10, AS, Parity Error
36648.336355  (Tue May 02, 2000 08:04:21 UTC) Sat PRN 3, El 21, Azm 164, SNR
12, AS, Parity Error
36648.336366  (Tue May 02, 2000 08:04:22 UTC) Sat PRN 6, El 15, Azm 44, SNR
11, AS
36648.336389  (Tue May 02, 2000 08:04:24 UTC) Sat PRN 3, El 21, Azm 164, SNR
10, AS
36648.336401  (Tue May 02, 2000 08:04:25 UTC) Sat PRN 3, El 21, Azm 164, SNR
11, AS, Parity Error
36648.336424  (Tue May 02, 2000 08:04:27 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Available
36648.336436  (Tue May 02, 2000 08:04:28 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Message Sync Detect
36648.336459  (Tue May 02, 2000 08:04:30 UTC) Sat PRN 6, El 15, Azm 44, SNR
13, AS, Parity Error
36648.336470  (Tue May 02, 2000 08:04:31 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Code Search
36648.336470  (Tue May 02, 2000 08:04:31 UTC) Sat PRN 19, El 9, Azm 282, SNR
0, Freq Acquire
36648.336505  (Tue May 02, 2000 08:04:34 UTC) Sat PRN 6, El 15, Azm 44, SNR
17, AS
36648.336517  (Tue May 02, 2000 08:04:35 UTC) Sat PRN 18, El 7, Azm 316, SNR
0, Freq Acquire
36648.336517  (Tue May 02, 2000 08:04:35 UTC) Sat PRN 19, El 9, Azm 282, SNR
0, Code Search
36648.336551  (Tue May 02, 2000 08:04:38 UTC) Sat PRN 18, El 7, Azm 316, SNR
0, Message Sync Detect
36648.336621  (Tue May 02, 2000 08:04:44 UTC) Sat PRN 18, El 7, Azm 316, SNR
0, Ephemeris Acquire
36648.336899  (Tue May 02, 2000 08:05:08 UTC) Sat PRN 18, El 7, Azm 316, SNR
19, AS
36648.337234  (Tue May 02, 2000 08:05:37 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Freq Acquire
36648.337281  (Tue May 02, 2000 08:05:41 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Code Search
36648.337292  (Tue May 02, 2000 08:05:42 UTC) Sat PRN 19, El 9, Azm 282, SNR
0, Freq Acquire
36648.337338  (Tue May 02, 2000 08:05:46 UTC) Sat PRN 19, El 9, Azm 282, SNR
0, Message Sync Detect
36648.337385  (Tue May 02, 2000 08:05:50 UTC) Sat PRN 19, El 9, Azm 282, SNR
0, Ephemeris Acquire
36648.337419  (Tue May 02, 2000 08:05:53 UTC) Sat PRN 3, El 21, Azm 164, SNR
0, Message Sync Detect
36648.337431  (Tue May 02, 2000 08:05:54 UTC) Sat PRN 3, El 21, Azm 164, SNR
16, AS
36648.337593  (Tue May 02, 2000 08:06:08 UTC) Sat PRN 19, El 9, Azm 282, SNR
19, AS
36648.337628  (Tue May 02, 2000 08:06:11 UTC) Sat PRN 3, El 21, Azm 164, SNR
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11, AS, Parity Error
36648.337663  (Tue May 02, 2000 08:06:14 UTC) Sat PRN 3, El 21, Azm 164, SNR
13, AS
36648.337755  (Tue May 02, 2000 08:06:22 UTC) Sat PRN 3, El 21, Azm 164, SNR
13, AS, Parity Error
36648.337790  (Tue May 02, 2000 08:06:25 UTC) Sat PRN 3, El 21, Azm 164, SNR
14, AS
36648.339491  (Tue May 02, 2000 08:08:52 UTC) Sat PRN 3, El 22, Azm 163, SNR
9, AS, Parity Error
36648.339538  (Tue May 02, 2000 08:08:56 UTC) Sat PRN 3, El 23, Azm 164, SNR
11, AS
36648.339549  (Tue May 02, 2000 08:08:57 UTC) Sat PRN 3, El 23, Azm 164, SNR
10, AS, Parity Error
36648.339561  (Tue May 02, 2000 08:08:58 UTC) Sat PRN 3, El 23, Azm 164, SNR
11, AS
36648.339584  (Tue May 02, 2000 08:09:00 UTC) Sat PRN 3, El 23, Azm 164, SNR
0, Message Sync Detect
36648.339607  (Tue May 02, 2000 08:09:02 UTC) Sat PRN 3, El 23, Azm 164, SNR
12, AS
36648.339908  (Tue May 02, 2000 08:09:28 UTC) Sat PRN 3, El 23, Azm 163, SNR
10, AS, Parity Error
36648.339989  (Tue May 02, 2000 08:09:35 UTC) Sat PRN 3, El 23, Azm 163, SNR
14, AS
36648.340128  (Tue May 02, 2000 08:09:47 UTC) Sat PRN 3, El 23, Azm 163, SNR
11, AS, Parity Error
36648.340163  (Tue May 02, 2000 08:09:50 UTC) Sat PRN 3, El 23, Azm 163, SNR
0, Available
36648.340186  (Tue May 02, 2000 08:09:52 UTC) Sat PRN 3, El 23, Azm 163, SNR
0, Message Sync Detect
36648.340197  (Tue May 02, 2000 08:09:53 UTC) Sat PRN 3, El 23, Azm 163, SNR
0, Code Search
36648.341841  (Tue May 02, 2000 08:12:15 UTC) Sat PRN 3, El 24, Azm 163, SNR
0, Message Sync Detect
36648.341852  (Tue May 02, 2000 08:12:16 UTC) Sat PRN 3, El 24, Azm 163, SNR
17, AS
36648.343669  (Tue May 02, 2000 08:14:53 UTC) Sat PRN 3, El 25, Azm 162, SNR
13, AS, Parity Error
36648.343704  (Tue May 02, 2000 08:14:56 UTC) Sat PRN 3, El 25, Azm 162, SNR
16, AS
36648.343785  (Tue May 02, 2000 08:15:03 UTC) Sat PRN 3, El 25, Azm 162, SNR
0, Available
36648.343808  (Tue May 02, 2000 08:15:05 UTC) Sat PRN 3, El 25, Azm 162, SNR
0, Code Search
36648.344457  (Tue May 02, 2000 08:16:01 UTC) Sat PRN 3, El 25, Azm 162, SNR
0, Freq Acquire
36648.344503  (Tue May 02, 2000 08:16:05 UTC) Sat PRN 3, El 25, Azm 162, SNR
0, Code Search
36648.344549  (Tue May 02, 2000 08:16:09 UTC) Sat PRN 3, El 26, Azm 162, SNR
0, Freq Acquire
36648.344584  (Tue May 02, 2000 08:16:12 UTC) Sat PRN 3, El 26, Azm 162, SNR
19, AS
36648.352836  (Tue May 02, 2000 08:28:05 UTC) Sat PRN 6, El 9, Azm 37, SNR 0,
Available
36648.352859  (Tue May 02, 2000 08:28:07 UTC) Sat PRN 6, El 9, Azm 37, SNR 11,
AS, Parity Error
36648.352871  (Tue May 02, 2000 08:28:08 UTC) Sat PRN 6, El 9, Azm 37, SNR 13,
AS
36648.353392  (Tue May 02, 2000 08:28:53 UTC) Sat PRN 31, El 0, Azm 0, SNR 0,
Code Search
36648.354318  (Tue May 02, 2000 08:30:13 UTC) Sat PRN 31, El 5, Azm 186, SNR
0, Freq Acquire
36648.354364  (Tue May 02, 2000 08:30:17 UTC) Sat PRN 31, El 5, Azm 186, SNR
0, Code Search
36648.360394  (Tue May 02, 2000 08:38:58 UTC) Sat PRN 31, El 9, Azm 185, SNR
0, Freq Acquire
36648.360417  (Tue May 02, 2000 08:39:00 UTC) Sat PRN 31, El 9, Azm 185, SNR
0, Message Sync Detect
36648.360440  (Tue May 02, 2000 08:39:02 UTC) Sat PRN 31, El 9, Azm 185, SNR
0, Ephemeris Acquire
36648.360788  (Tue May 02, 2000 08:39:32 UTC) Sat PRN 31, El 9, Azm 185, SNR
20, AS
36648.361737  (Tue May 02, 2000 08:40:54 UTC) Sat PRN 31, El 9, Azm 185, SNR
11, AS, Parity Error
36648.361760  (Tue May 02, 2000 08:40:56 UTC) Sat PRN 31, El 9, Azm 185, SNR
9, AS
36648.361771  (Tue May 02, 2000 08:40:57 UTC) Sat PRN 31, El 9, Azm 185, SNR
9, AS, Parity Error
36648.361783  (Tue May 02, 2000 08:40:58 UTC) Sat PRN 31, El 9, Azm 185, SNR
0, Message Sync Detect
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36648.361864  (Tue May 02, 2000 08:41:05 UTC) Sat PRN 31, El 9, Azm 185, SNR
0, Code Search
36648.362119  (Tue May 02, 2000 08:41:27 UTC) Sat PRN 6, El 5, Azm 34, SNR 12,
AS, Parity Error
36648.362142  (Tue May 02, 2000 08:41:29 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Available
36648.362176  (Tue May 02, 2000 08:41:32 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.362489  (Tue May 02, 2000 08:41:59 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.362535  (Tue May 02, 2000 08:42:03 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.362582  (Tue May 02, 2000 08:42:07 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.362628  (Tue May 02, 2000 08:42:11 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.362732  (Tue May 02, 2000 08:42:20 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.362778  (Tue May 02, 2000 08:42:24 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.362859  (Tue May 02, 2000 08:42:31 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.362906  (Tue May 02, 2000 08:42:35 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.363033  (Tue May 02, 2000 08:42:46 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.363079  (Tue May 02, 2000 08:42:50 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.363149  (Tue May 02, 2000 08:42:56 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.363195  (Tue May 02, 2000 08:43:00 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.363241  (Tue May 02, 2000 08:43:04 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Freq Acquire
36648.363288  (Tue May 02, 2000 08:43:08 UTC) Sat PRN 6, El 5, Azm 34, SNR 0,
Code Search
36648.363345  (Tue May 02, 2000 08:43:13 UTC) Sat PRN 6 no longer in use
36648.363507  (Tue May 02, 2000 08:43:27 UTC) Sat PRN 6, El 0, Azm 0, SNR 0,
Code Search
36648.363693  (Tue May 02, 2000 08:43:43 UTC) Sat PRN 6 no longer in use
36648.365556  (Tue May 02, 2000 08:46:24 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Freq Acquire
36648.365602  (Tue May 02, 2000 08:46:28 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Code Search
36648.365845  (Tue May 02, 2000 08:46:49 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Freq Acquire
36648.365892  (Tue May 02, 2000 08:46:53 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Code Search
36648.365996  (Tue May 02, 2000 08:47:02 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Freq Acquire
36648.366054  (Tue May 02, 2000 08:47:07 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Code Search
36648.366193  (Tue May 02, 2000 08:47:19 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Freq Acquire
36648.366250  (Tue May 02, 2000 08:47:24 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Code Search
36648.366297  (Tue May 02, 2000 08:47:28 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Freq Acquire
36648.366343  (Tue May 02, 2000 08:47:32 UTC) Sat PRN 31, El 12, Azm 184, SNR
0, Code Search
36648.367720  (Tue May 02, 2000 08:49:31 UTC) Sat PRN 16, El 25, Azm 269, SNR
0, Available
36648.367732  (Tue May 02, 2000 08:49:32 UTC) Sat PRN 16, El 25, Azm 269, SNR
0, Message Sync Detect
36648.367744  (Tue May 02, 2000 08:49:33 UTC) Sat PRN 16, El 25, Azm 269, SNR
0, Code Search
36648.367790  (Tue May 02, 2000 08:49:37 UTC) Sat PRN 16, El 25, Azm 269, SNR
0, Message Sync Detect
36648.367801  (Tue May 02, 2000 08:49:38 UTC) Sat PRN 16, El 25, Azm 269, SNR
23, AS
36648.367813  (Tue May 02, 2000 08:49:39 UTC) Sat PRN 16, El 25, Azm 269, SNR
23, AS, Parity Error
36648.367836  (Tue May 02, 2000 08:49:41 UTC) Sat PRN 16, El 25, Azm 269, SNR
23, AS
36648.367952  (Tue May 02, 2000 08:49:51 UTC) Sat PRN 3, El 40, Azm 155, SNR
0, Available
36648.367998  (Tue May 02, 2000 08:49:55 UTC) Sat PRN 3, El 40, Azm 155, SNR
14, AS, Parity Error
36648.368033  (Tue May 02, 2000 08:49:58 UTC) Sat PRN 3, El 40, Azm 155, SNR
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16, AS
36648.368207 (Tue May 02, 2000 08:50:13 UTC) Sat PRN 3, El 40, Azm 155, SNR
10, AS, Parity Error
36648.368230 (Tue May 02, 2000 08:50:15 UTC) Sat PRN 3, El 40, Azm 155, SNR
0, Message Sync Detect
36648.368264 (Tue May 02, 2000 08:50:18 UTC) Sat PRN 3, El 40, Azm 155, SNR
0, Code Search
36648.368334 (Tue May 02, 2000 08:50:24 UTC) Sat PRN 3, El 40, Azm 155, SNR
0, Freq Acquire
36648.368380 (Tue May 02, 2000 08:50:28 UTC) Sat PRN 3, El 40, Azm 155, SNR
0, Code Search
36648.368982 (Tue May 02, 2000 08:51:20 UTC) Sat PRN 3, El 41, Azm 154, SNR
0, Freq Acquire
36648.369028 (Tue May 02, 2000 08:51:24 UTC) Sat PRN 3, El 41, Azm 154, SNR
0, Code Search
36648.369086 (Tue May 02, 2000 08:51:29 UTC) Sat PRN 3, El 41, Azm 154, SNR
0, Freq Acquire
36648.369121 (Tue May 02, 2000 08:51:32 UTC) Sat PRN 3, El 41, Azm 154, SNR
12, AS
36648.369156 (Tue May 02, 2000 08:51:35 UTC) Sat PRN 3, El 41, Azm 154, SNR
21, AS, Parity Error
36648.369202 (Tue May 02, 2000 08:51:39 UTC) Sat PRN 3, El 41, Azm 154, SNR
23, AS
36648.370707 (Tue May 02, 2000 08:53:49 UTC) Sat PRN 16, El 25, Azm 267, SNR
0, Available
36648.370718 (Tue May 02, 2000 08:53:50 UTC) Sat PRN 16, El 25, Azm 267, SNR
0, Message Sync Detect
36648.370730 (Tue May 02, 2000 08:53:51 UTC) Sat PRN 16, El 25, Azm 267, SNR
0, Code Search
36648.370776 (Tue May 02, 2000 08:53:55 UTC) Sat PRN 16, El 25, Azm 267, SNR
0, Message Sync Detect
36648.370788 (Tue May 02, 2000 08:53:56 UTC) Sat PRN 16, El 25, Azm 267, SNR
25, AS, Parity Error
36648.370811 (Tue May 02, 2000 08:53:58 UTC) Sat PRN 16, El 25, Azm 267, SNR
26, AS
36648.371748 (Tue May 02, 2000 08:55:19 UTC) Sat PRN 16, El 24, Azm 267, SNR
0, Available
36648.371760 (Tue May 02, 2000 08:55:20 UTC) Sat PRN 16, El 24, Azm 267, SNR
0, Message Sync Detect
36648.371771 (Tue May 02, 2000 08:55:21 UTC) Sat PRN 16, El 24, Azm 267, SNR
0, Code Search
36648.371818 (Tue May 02, 2000 08:55:25 UTC) Sat PRN 16, El 24, Azm 267, SNR
0, Message Sync Detect
36648.371829 (Tue May 02, 2000 08:55:26 UTC) Sat PRN 16, El 24, Azm 266, SNR
25, AS, Parity Error
36648.371852 (Tue May 02, 2000 08:55:28 UTC) Sat PRN 16, El 24, Azm 266, SNR
24, AS
36648.374144 (Tue May 02, 2000 08:58:46 UTC) Sat PRN 3, El 44, Azm 152, SNR
10, AS, Parity Error
36648.374156 (Tue May 02, 2000 08:58:47 UTC) Sat PRN 3, El 44, Azm 152, SNR
10, AS
36648.374179 (Tue May 02, 2000 08:58:49 UTC) Sat PRN 3, El 44, Azm 152, SNR
0, Message Sync Detect
36648.374190 (Tue May 02, 2000 08:58:50 UTC) Sat PRN 3, El 44, Azm 152, SNR
0, Available
36648.374202 (Tue May 02, 2000 08:58:51 UTC) Sat PRN 3, El 44, Azm 152, SNR
14, AS
36648.374746 (Tue May 02, 2000 08:59:38 UTC) Sat PRN 31, El 17, Azm 183, SNR
0, Freq Acquire
36648.374757 (Tue May 02, 2000 08:59:39 UTC) Sat PRN 3, El 44, Azm 152, SNR
12, AS, Parity Error
36648.374757 (Tue May 02, 2000 08:59:39 UTC) Sat PRN 31, El 17, Azm 183, SNR
0, Message Sync Detect
36648.374769 (Tue May 02, 2000 08:59:40 UTC) Sat PRN 3, El 44, Azm 152, SNR
0, Message Sync Detect
36648.374792 (Tue May 02, 2000 08:59:42 UTC) Sat PRN 3, El 44, Azm 152, SNR
0, Code Search
36648.374885 (Tue May 02, 2000 08:59:50 UTC) Sat PRN 31, El 17, Azm 183, SNR
0, Available
36648.374896 (Tue May 02, 2000 08:59:51 UTC) Sat PRN 31, El 17, Azm 183, SNR
19, AS, Parity Error
36648.374908 (Tue May 02, 2000 08:59:52 UTC) Sat PRN 31, El 17, Azm 183, SNR
18, AS
36648.375105 (Tue May 02, 2000 09:00:09 UTC) Sat PRN 3, El 45, Azm 152, SNR
0, Freq Acquire
36648.375116 (Tue May 02, 2000 09:00:10 UTC) Sat PRN 3, El 45, Azm 152, SNR
17, AS
36648.376447 (Tue May 02, 2000 09:02:05 UTC) Sat PRN 31, El 18, Azm 183, SNR
14, AS, Parity Error

36648.376505 (Tue May 02, 2000 09:02:10 UTC) Sat PRN 31, El 18, Azm 183, SNR
14, AS
36648.376517 (Tue May 02, 2000 09:02:11 UTC) Sat PRN 31, El 18, Azm 183, SNR
12, AS, Parity Error
36648.376551 (Tue May 02, 2000 09:02:14 UTC) Sat PRN 31, El 18, Azm 183, SNR
14, AS
36648.376725 (Tue May 02, 2000 09:02:29 UTC) Sat PRN 31, El 18, Azm 183, SNR
0, Available
====================

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Kohjin Yamada
Sent: Tuesday, May 02, 2000 5:22 AM
To: TAPR Special Interest Group
Cc: TAPR APRS SIG; AMSAT BB
Subject: [tacgps] Re: [amsat-bb] More on GPS S/A Going Away

SA set off at around 09:00 UTC May 2 !!!

I'm watching TAC32 shows the height stays within 1m now, big surprise.

Kohjin - JR1EDE

You are currently subscribed to tacgps as: RICK@CNSSYS.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] FW: More on GPS S/A Going Away

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 2 May 2000 07:32:03 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81263-2000.05.02-06.33.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HERE IT IS AGAIN WITH LINE WRAP SET TO 132 instead of 78. Should be more readable.

All,

I wrote a special version of Tac32Plus yesterday specifically to capture this event. The receiver used
in this test was a Motorola
M12 Version 1.3.

The following data is extracted from a log that stores every significant change in satellite status (NOT
 Azimuth, Elevation, SNR).
Because of this most of the entries show the events during signal acquisition and loss of signal. Once
the satellite is being
tracked only the occasional parity error is logged. EXCEPT for the change in SA state around 08:00 UTC!

The following data is from a two hour period from 07:00 UTC to 09:00 UTC. At 07:59:50 things begin to
happen all at once.

Rick WB2TNL
=============
36648.291285 (Tue May 02, 2000 06:59:27 UTC) Sat PRN 6, El 20, Azm 71, SNR 14, AS, SA
36648.292373 (Tue May 02, 2000 07:01:01 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Available
36648.292419 (Tue May 02, 2000 07:01:05 UTC) Sat PRN 6, El 20, Azm 71, SNR 12, AS, SA
36648.292593 (Tue May 02, 2000 07:01:20 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Available
36648.292616 (Tue May 02, 2000 07:01:22 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Message Sync Detect
36648.292628 (Tue May 02, 2000 07:01:23 UTC) Sat PRN 6, El 20, Azm 71, SNR 0, Code Search
36648.294237 (Tue May 02, 2000 07:03:42 UTC) Sat PRN 6, El 20, Azm 69, SNR 0, Freq Acquire
36648.294260 (Tue May 02, 2000 07:03:44 UTC) Sat PRN 6, El 20, Azm 69, SNR 12, AS, SA
36648.294341 (Tue May 02, 2000 07:03:51 UTC) Sat PRN 6, El 20, Azm 69, SNR 21, AS, SA, Parity Error
36648.294399 (Tue May 02, 2000 07:03:56 UTC) Sat PRN 6, El 20, Azm 69, SNR 19, AS, SA
36648.296829 (Tue May 02, 2000 07:07:26 UTC) Sat PRN 29, El 19, Azm 127, SNR 10, AS, SA, Parity Error
36648.296841 (Tue May 02, 2000 07:07:27 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Available
36648.296852 (Tue May 02, 2000 07:07:28 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Message Sync Detect
36648.296875 (Tue May 02, 2000 07:07:30 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Code Search
36648.297373 (Tue May 02, 2000 07:08:13 UTC) Sat PRN 29, El 18, Azm 127, SNR 0, Freq Acquire

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36648.297419  (Tue May 02, 2000 07:08:17 UTC) Sat PRN 29, El 18, Azm 127, SNR 0, Code Search
36648.297454  (Tue May 02, 2000 07:08:20 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Freq Acquire
36648.297466  (Tue May 02, 2000 07:08:21 UTC) Sat PRN 29, El 19, Azm 127, SNR 0, Message Sync Detect
36648.297477  (Tue May 02, 2000 07:08:22 UTC) Sat PRN 29, El 19, Azm 127, SNR 22, AS, SA
36648.297709  (Tue May 02, 2000 07:08:42 UTC) Sat PRN 6, El 20, Azm 67, SNR 10, AS, SA, Parity Error
36648.297744  (Tue May 02, 2000 07:08:45 UTC) Sat PRN 6, El 20, Azm 67, SNR 9, AS, SA
36648.297767  (Tue May 02, 2000 07:08:47 UTC) Sat PRN 6, El 20, Azm 67, SNR 12, AS, SA, Parity Error
36648.297813  (Tue May 02, 2000 07:08:51 UTC) Sat PRN 6, El 20, Azm 67, SNR 11, AS, SA
36648.298033  (Tue May 02, 2000 07:09:10 UTC) Sat PRN 6, El 20, Azm 67, SNR 10, AS, SA, Parity Error
36648.298044  (Tue May 02, 2000 07:09:11 UTC) Sat PRN 6, El 20, Azm 67, SNR 0, Available
36648.298102  (Tue May 02, 2000 07:09:16 UTC) Sat PRN 6, El 20, Azm 67, SNR 0, Message Sync Detect
36648.298149  (Tue May 02, 2000 07:09:20 UTC) Sat PRN 6, El 20, Azm 67, SNR 12, AS, SA
36648.298207  (Tue May 02, 2000 07:09:25 UTC) Sat PRN 6, El 20, Azm 67, SNR 0, Available
36648.298218  (Tue May 02, 2000 07:09:26 UTC) Sat PRN 6, El 20, Azm 67, SNR 0, Message Sync Detect
36648.298241  (Tue May 02, 2000 07:09:28 UTC) Sat PRN 6, El 20, Azm 67, SNR 0, Code Search
36648.298785  (Tue May 02, 2000 07:10:15 UTC) Sat PRN 6, El 20, Azm 66, SNR 0, Freq Acquire
36648.298820  (Tue May 02, 2000 07:10:18 UTC) Sat PRN 6, El 20, Azm 66, SNR 15, AS, SA
36648.299028  (Tue May 02, 2000 07:10:36 UTC) Sat PRN 6, El 20, Azm 66, SNR 0, Available
36648.299040  (Tue May 02, 2000 07:10:37 UTC) Sat PRN 6, El 20, Azm 66, SNR 11, AS, SA, Parity Error
36648.299075  (Tue May 02, 2000 07:10:40 UTC) Sat PRN 6, El 20, Azm 66, SNR 12, AS, SA
36648.300753  (Tue May 02, 2000 07:13:05 UTC) Sat PRN 30, El 9, Azm 43, SNR 14, AS, SA, Parity Error
36648.300788  (Tue May 02, 2000 07:13:08 UTC) Sat PRN 30, El 9, Azm 43, SNR 14, AS, SA
36648.306586  (Tue May 02, 2000 07:21:29 UTC) Sat PRN 29, El 13, Azm 131, SNR 12, AS, SA, Parity Error
36648.306609  (Tue May 02, 2000 07:21:31 UTC) Sat PRN 29, El 13, Azm 131, SNR 0, Available
36648.306644  (Tue May 02, 2000 07:21:34 UTC) Sat PRN 6, El 20, Azm 61, SNR 11, AS, SA, Parity Error
36648.306644  (Tue May 02, 2000 07:21:34 UTC) Sat PRN 29, El 13, Azm 131, SNR 0, Code Search
36648.306679  (Tue May 02, 2000 07:21:37 UTC) Sat PRN 6, El 20, Azm 61, SNR 13, AS, SA
36648.306980  (Tue May 02, 2000 07:22:03 UTC) Sat PRN 3, El 0, Azm 0, SNR 0, Code Search
36648.307385  (Tue May 02, 2000 07:22:38 UTC) Sat PRN 29, El 13, Azm 131, SNR 0, Freq Acquire
36648.307431  (Tue May 02, 2000 07:22:42 UTC) Sat PRN 29, El 13, Azm 131, SNR 0, Code Search
36648.307477  (Tue May 02, 2000 07:22:46 UTC) Sat PRN 29, El 13, Azm 131, SNR 0, Freq Acquire
36648.307489  (Tue May 02, 2000 07:22:47 UTC) Sat PRN 29, El 13, Azm 131, SNR 13, AS, SA
36648.308102  (Tue May 02, 2000 07:23:40 UTC) Sat PRN 30, El 5, Azm 43, SNR 14, AS, SA, Parity Error
36648.308137  (Tue May 02, 2000 07:23:43 UTC) Sat PRN 30, El 5, Azm 44, SNR 13, AS, SA
36648.308183  (Tue May 02, 2000 07:23:47 UTC) Sat PRN 30, El 5, Azm 44, SNR 12, AS, SA, Parity Error
36648.308218  (Tue May 02, 2000 07:23:50 UTC) Sat PRN 30, El 5, Azm 44, SNR 0, Available
36648.308264  (Tue May 02, 2000 07:23:54 UTC) Sat PRN 30, El 5, Azm 44, SNR 0, Code Search
36648.308345  (Tue May 02, 2000 07:24:01 UTC) Sat PRN 30 no longer in use
36648.309630  (Tue May 02, 2000 07:25:52 UTC) Sat PRN 6, El 20, Azm 59, SNR 12, AS, SA, Parity Error
36648.309711  (Tue May 02, 2000 07:25:59 UTC) Sat PRN 6, El 20, Azm 59, SNR 14, AS, SA
36648.310406  (Tue May 02, 2000 07:26:59 UTC) Sat PRN 29, El 11, Azm 132, SNR 0, Available
36648.310440  (Tue May 02, 2000 07:27:02 UTC) Sat PRN 29, El 11, Azm 132, SNR 0, Code Search
36648.313855  (Tue May 02, 2000 07:31:57 UTC) Sat PRN 29, El 9, Azm 133, SNR 0, Freq Acquire
36648.313901  (Tue May 02, 2000 07:32:01 UTC) Sat PRN 29, El 9, Azm 133, SNR 0, Code Search
36648.315521  (Tue May 02, 2000 07:34:21 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Freq Acquire
36648.315568  (Tue May 02, 2000 07:34:25 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Code Search
36648.315602  (Tue May 02, 2000 07:34:28 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Message Sync Detect
36648.315649  (Tue May 02, 2000 07:34:32 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Ephemeris Acquire
36648.315950  (Tue May 02, 2000 07:34:58 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Message Sync Detect
36648.315984  (Tue May 02, 2000 07:35:01 UTC) Sat PRN 3, El 9, Azm 169, SNR 0, Code Search
36648.317605  (Tue May 02, 2000 07:37:21 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Freq Acquire
36648.317651  (Tue May 02, 2000 07:37:25 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Code Search
36648.317744  (Tue May 02, 2000 07:37:33 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Freq Acquire
36648.317790  (Tue May 02, 2000 07:37:37 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Code Search
36648.318010  (Tue May 02, 2000 07:37:56 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Freq Acquire
36648.318021  (Tue May 02, 2000 07:37:57 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Message Sync Detect
36648.318079  (Tue May 02, 2000 07:38:02 UTC) Sat PRN 3, El 10, Azm 169, SNR 0, Ephemeris Acquire
36648.318426  (Tue May 02, 2000 07:38:32 UTC) Sat PRN 3, El 11, Azm 169, SNR 19, AS, SA
36648.318982  (Tue May 02, 2000 07:39:20 UTC) Sat PRN 6, El 19, Azm 54, SNR 0, Available
36648.318994  (Tue May 02, 2000 07:39:21 UTC) Sat PRN 6, El 19, Azm 54, SNR 0, Message Sync Detect
36648.319028  (Tue May 02, 2000 07:39:24 UTC) Sat PRN 6, El 19, Azm 54, SNR 0, Code Search
36648.319503  (Tue May 02, 2000 07:40:05 UTC) Sat PRN 6, El 19, Azm 53, SNR 0, Freq Acquire
36648.319514  (Tue May 02, 2000 07:40:06 UTC) Sat PRN 6, El 19, Azm 53, SNR 14, AS, SA
36648.322547  (Tue May 02, 2000 07:44:28 UTC) Sat PRN 29 no longer in use
36648.323276  (Tue May 02, 2000 07:45:31 UTC) Sat PRN 3, El 13, Azm 167, SNR 12, AS, SA, Parity Error
36648.323311  (Tue May 02, 2000 07:45:34 UTC) Sat PRN 3, El 13, Azm 167, SNR 13, AS, SA
36648.323658  (Tue May 02, 2000 07:46:04 UTC) Sat PRN 3, El 13, Azm 167, SNR 0, Available
36648.323785  (Tue May 02, 2000 07:46:15 UTC) Sat PRN 3, El 14, Azm 167, SNR 0, Code Search
36648.325625  (Tue May 02, 2000 07:48:54 UTC) Sat PRN 19, El 0, Azm 0, SNR 0, Code Search
36648.325811  (Tue May 02, 2000 07:49:10 UTC) Sat PRN 19 no longer in use
36648.325973  (Tue May 02, 2000 07:49:24 UTC) Sat PRN 19, El 0, Azm 0, SNR 0, Code Search
36648.326100  (Tue May 02, 2000 07:49:35 UTC) Sat PRN 3, El 15, Azm 167, SNR 0, Freq Acquire
36648.326146  (Tue May 02, 2000 07:49:39 UTC) Sat PRN 3, El 15, Azm 167, SNR 0, Code Search
36648.326713  (Tue May 02, 2000 07:50:28 UTC) Sat PRN 6, El 17, Azm 49, SNR 14, AS, SA, Parity Error
36648.326783  (Tue May 02, 2000 07:50:34 UTC) Sat PRN 6, El 17, Azm 49, SNR 15, AS, SA
36648.327686  (Tue May 02, 2000 07:51:52 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Freq Acquire
36648.327732  (Tue May 02, 2000 07:51:56 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Code Search
36648.327767  (Tue May 02, 2000 07:51:59 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Freq Acquire
36648.327813  (Tue May 02, 2000 07:52:03 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Code Search
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36648.328079  (Tue May 02, 2000 07:52:26 UTC) Sat PRN 6, El 17, Azm 48, SNR 0, Available
36648.328149  (Tue May 02, 2000 07:52:32 UTC) Sat PRN 6, El 17, Azm 48, SNR 0, Message Sync Detect
36648.328160  (Tue May 02, 2000 07:52:33 UTC) Sat PRN 6, El 17, Azm 48, SNR 0, Code Search
36648.328739  (Tue May 02, 2000 07:53:23 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Freq Acquire
36648.328762  (Tue May 02, 2000 07:53:25 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Message Sync Detect
36648.328774  (Tue May 02, 2000 07:53:26 UTC) Sat PRN 6, El 17, Azm 48, SNR 0, Freq Acquire
36648.328785  (Tue May 02, 2000 07:53:27 UTC) Sat PRN 6, El 17, Azm 48, SNR 14, AS, SA
36648.328797  (Tue May 02, 2000 07:53:28 UTC) Sat PRN 6, El 17, Azm 48, SNR 20, AS, SA, Parity Error
36648.328843  (Tue May 02, 2000 07:53:32 UTC) Sat PRN 3, El 16, Azm 166, SNR 0, Available
36648.328843  (Tue May 02, 2000 07:53:32 UTC) Sat PRN 6, El 17, Azm 48, SNR 19, AS, SA
36648.328855  (Tue May 02, 2000 07:53:33 UTC) Sat PRN 3, El 16, Azm 166, SNR 17, AS, SA
36648.330718  (Tue May 02, 2000 07:56:14 UTC) Sat PRN 3, El 17, Azm 166, SNR 11, AS, SA, Parity Error
36648.330741  (Tue May 02, 2000 07:56:16 UTC) Sat PRN 3, El 17, Azm 166, SNR 0, Available
36648.330764  (Tue May 02, 2000 07:56:18 UTC) Sat PRN 3, El 17, Azm 166, SNR 0, Message Sync Detect
36648.330788  (Tue May 02, 2000 07:56:20 UTC) Sat PRN 3, El 17, Azm 166, SNR 12, AS, SA
36648.331540  (Tue May 02, 2000 07:57:25 UTC) Sat PRN 6, El 16, Azm 47, SNR 11, AS, SA, Parity Error
36648.331563  (Tue May 02, 2000 07:57:27 UTC) Sat PRN 6, El 16, Azm 47, SNR 0, Available
36648.331575  (Tue May 02, 2000 07:57:28 UTC) Sat PRN 6, El 16, Azm 47, SNR 0, Message Sync Detect
36648.331598  (Tue May 02, 2000 07:57:30 UTC) Sat PRN 6, El 16, Azm 47, SNR 0, Code Search
36648.332153  (Tue May 02, 2000 07:58:18 UTC) Sat PRN 6, El 16, Azm 46, SNR 0, Freq Acquire
36648.332200  (Tue May 02, 2000 07:58:22 UTC) Sat PRN 6, El 16, Azm 46, SNR 0, Code Search
36648.332281  (Tue May 02, 2000 07:58:29 UTC) Sat PRN 3, El 18, Azm 165, SNR 13, AS, SA, Parity Error
36648.332315  (Tue May 02, 2000 07:58:32 UTC) Sat PRN 3, El 18, Azm 165, SNR 12, AS, SA
36648.332338  (Tue May 02, 2000 07:58:34 UTC) Sat PRN 3, El 18, Azm 165, SNR 11, AS, SA, Parity Error
36648.332373  (Tue May 02, 2000 07:58:37 UTC) Sat PRN 3, El 18, Azm 165, SNR 10, AS, SA
36648.332385  (Tue May 02, 2000 07:58:38 UTC) Sat PRN 3, El 18, Azm 165, SNR 12, AS, SA, Parity Error
36648.332454  (Tue May 02, 2000 07:58:44 UTC) Sat PRN 3, El 18, Azm 165, SNR 10, AS, SA
36648.332500  (Tue May 02, 2000 07:58:48 UTC) Sat PRN 3, El 18, Azm 165, SNR 12, AS, SA, Parity Error
36648.332535  (Tue May 02, 2000 07:58:51 UTC) Sat PRN 3, El 18, Azm 165, SNR 14, AS, SA
36648.332906  (Tue May 02, 2000 07:59:23 UTC) Sat PRN 18, El 0, Azm 0, SNR 0, Code Search
***
*** THIS IS IT!! - Sats 1,3,16,22,25 switch all at once.
***
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 1, El 41, Azm 312, SNR 25, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 3, El 19, Azm 165, SNR 20, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 16, El 28, Azm 294, SNR 22, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 22, El 79, Azm 223, SNR 29, AS
36648.333218  (Tue May 02, 2000 07:59:50 UTC) Sat PRN 25, El 46, Azm 72, SNR 30, AS
*** Acqusition of Sat 6 - NO SA!
36648.333750  (Tue May 02, 2000 08:00:36 UTC) Sat PRN 6, El 15, Azm 46, SNR 0, Freq Acquire
36648.333774  (Tue May 02, 2000 08:00:38 UTC) Sat PRN 6, El 15, Azm 45, SNR 0, Message Sync Detect
36648.333797  (Tue May 02, 2000 08:00:40 UTC) Sat PRN 6, El 15, Azm 45, SNR 0, Code Search
36648.333832  (Tue May 02, 2000 08:00:43 UTC) Sat PRN 6, El 15, Azm 45, SNR 11, AS, SA
36648.333855  (Tue May 02, 2000 08:00:45 UTC) Sat PRN 6, El 15, Azm 45, SNR 18, AS, SA, Parity Error
36648.333913  (Tue May 02, 2000 08:00:50 UTC) Sat PRN 6, El 15, Azm 45, SNR 18, AS
36648.334364  (Tue May 02, 2000 08:01:29 UTC) Sat PRN 6, El 15, Azm 45, SNR 13, AS, Parity Error
36648.334422  (Tue May 02, 2000 08:01:34 UTC) Sat PRN 6, El 15, Azm 45, SNR 14, AS
***
*** Acqusition of Sats 18 and 19 - takes a while before we get a good signal
*** (see 08:05:08 and 08:06:08) but when we do there is NO SA!
***
36648.334723  (Tue May 02, 2000 08:02:00 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Freq Acquire
36648.334769  (Tue May 02, 2000 08:02:04 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Code Search
36648.334792  (Tue May 02, 2000 08:02:06 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Freq Acquire
36648.334838  (Tue May 02, 2000 08:02:10 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Code Search
36648.335047  (Tue May 02, 2000 08:02:28 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Freq Acquire
36648.335093  (Tue May 02, 2000 08:02:32 UTC) Sat PRN 19, El 8, Azm 281, SNR 0, Code Search
36648.335301  (Tue May 02, 2000 08:02:50 UTC) Sat PRN 18, El 6, Azm 315, SNR 0, Freq Acquire
36648.335348  (Tue May 02, 2000 08:02:54 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Code Search
36648.335533  (Tue May 02, 2000 08:03:10 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Freq Acquire
36648.335579  (Tue May 02, 2000 08:03:14 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Code Search
36648.335625  (Tue May 02, 2000 08:03:18 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Freq Acquire
36648.335672  (Tue May 02, 2000 08:03:22 UTC) Sat PRN 18, El 6, Azm 315, SNR 0, Code Search
36648.336169  (Tue May 02, 2000 08:04:05 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Freq Acquire
36648.336216  (Tue May 02, 2000 08:04:09 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Code Search
36648.336239  (Tue May 02, 2000 08:04:11 UTC) Sat PRN 6, El 15, Azm 44, SNR 11, AS, Parity Error
36648.336239  (Tue May 02, 2000 08:04:11 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Freq Acquire
36648.336274  (Tue May 02, 2000 08:04:14 UTC) Sat PRN 6, El 15, Azm 44, SNR 14, AS
36648.336285  (Tue May 02, 2000 08:04:15 UTC) Sat PRN 18, El 6, Azm 316, SNR 0, Code Search
36648.336343  (Tue May 02, 2000 08:04:20 UTC) Sat PRN 6, El 15, Azm 44, SNR 10, AS, Parity Error
36648.336355  (Tue May 02, 2000 08:04:21 UTC) Sat PRN 3, El 21, Azm 164, SNR 12, AS, Parity Error
36648.336366  (Tue May 02, 2000 08:04:22 UTC) Sat PRN 6, El 15, Azm 44, SNR 11, AS
36648.336389  (Tue May 02, 2000 08:04:24 UTC) Sat PRN 3, El 21, Azm 164, SNR 10, AS
36648.336401  (Tue May 02, 2000 08:04:25 UTC) Sat PRN 3, El 21, Azm 164, SNR 11, AS, Parity Error
36648.336424  (Tue May 02, 2000 08:04:27 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Available
36648.336436  (Tue May 02, 2000 08:04:28 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Message Sync Detect
36648.336459  (Tue May 02, 2000 08:04:30 UTC) Sat PRN 6, El 15, Azm 44, SNR 13, AS, Parity Error
36648.336470  (Tue May 02, 2000 08:04:31 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Code Search
36648.336470  (Tue May 02, 2000 08:04:31 UTC) Sat PRN 19, El 9, Azm 282, SNR 0, Freq Acquire
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36648.336505  (Tue May 02, 2000 08:04:34 UTC) Sat PRN 6, El 15, Azm 44, SNR 17, AS
36648.336517  (Tue May 02, 2000 08:04:35 UTC) Sat PRN 18, El 7, Azm 316, SNR 0, Freq Acquire
36648.336517  (Tue May 02, 2000 08:04:35 UTC) Sat PRN 19, El 9, Azm 282, SNR 0, Code Search
36648.336551  (Tue May 02, 2000 08:04:38 UTC) Sat PRN 18, El 7, Azm 316, SNR 0, Message Sync Detect
36648.336621  (Tue May 02, 2000 08:04:44 UTC) Sat PRN 18, El 7, Azm 316, SNR 0, Ephemeris Acquire
36648.336899  (Tue May 02, 2000 08:05:08 UTC) Sat PRN 18, El 7, Azm 316, SNR 19, AS
36648.337234  (Tue May 02, 2000 08:05:37 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Freq Acquire
36648.337281  (Tue May 02, 2000 08:05:41 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Code Search
36648.337292  (Tue May 02, 2000 08:05:42 UTC) Sat PRN 19, El 9, Azm 282, SNR 0, Freq Acquire
36648.337338  (Tue May 02, 2000 08:05:46 UTC) Sat PRN 19, El 9, Azm 282, SNR 0, Message Sync Detect
36648.337385  (Tue May 02, 2000 08:05:50 UTC) Sat PRN 19, El 9, Azm 282, SNR 0, Ephemeris Acquire
36648.337419  (Tue May 02, 2000 08:05:53 UTC) Sat PRN 3, El 21, Azm 164, SNR 0, Message Sync Detect
36648.337431  (Tue May 02, 2000 08:05:54 UTC) Sat PRN 3, El 21, Azm 164, SNR 16, AS
36648.337593  (Tue May 02, 2000 08:06:08 UTC) Sat PRN 19, El 9, Azm 282, SNR 19, AS
36648.337628  (Tue May 02, 2000 08:06:11 UTC) Sat PRN 3, El 21, Azm 164, SNR 11, AS, Parity Error
36648.337663  (Tue May 02, 2000 08:06:14 UTC) Sat PRN 3, El 21, Azm 164, SNR 13, AS
36648.337755  (Tue May 02, 2000 08:06:22 UTC) Sat PRN 3, El 21, Azm 164, SNR 13, AS, Parity Error
36648.337790  (Tue May 02, 2000 08:06:25 UTC) Sat PRN 3, El 21, Azm 164, SNR 14, AS
36648.339491  (Tue May 02, 2000 08:08:52 UTC) Sat PRN 3, El 22, Azm 163, SNR 9, AS, Parity Error
36648.339538  (Tue May 02, 2000 08:08:56 UTC) Sat PRN 3, El 23, Azm 164, SNR 11, AS
36648.339549  (Tue May 02, 2000 08:08:57 UTC) Sat PRN 3, El 23, Azm 164, SNR 10, AS, Parity Error
36648.339561  (Tue May 02, 2000 08:08:58 UTC) Sat PRN 3, El 23, Azm 164, SNR 11, AS
36648.339584  (Tue May 02, 2000 08:09:00 UTC) Sat PRN 3, El 23, Azm 164, SNR 0, Message Sync Detect
36648.339607  (Tue May 02, 2000 08:09:02 UTC) Sat PRN 3, El 23, Azm 164, SNR 12, AS
36648.339908  (Tue May 02, 2000 08:09:28 UTC) Sat PRN 3, El 23, Azm 163, SNR 10, AS, Parity Error
36648.339989  (Tue May 02, 2000 08:09:35 UTC) Sat PRN 3, El 23, Azm 163, SNR 14, AS
36648.340128  (Tue May 02, 2000 08:09:47 UTC) Sat PRN 3, El 23, Azm 163, SNR 11, AS, Parity Error
36648.340163  (Tue May 02, 2000 08:09:50 UTC) Sat PRN 3, El 23, Azm 163, SNR 0, Available
36648.340186  (Tue May 02, 2000 08:09:52 UTC) Sat PRN 3, El 23, Azm 163, SNR 0, Message Sync Detect
36648.340197  (Tue May 02, 2000 08:09:53 UTC) Sat PRN 3, El 23, Azm 163, SNR 0, Code Search
36648.341841  (Tue May 02, 2000 08:12:15 UTC) Sat PRN 3, El 24, Azm 163, SNR 0, Message Sync Detect
36648.341852  (Tue May 02, 2000 08:12:16 UTC) Sat PRN 3, El 24, Azm 163, SNR 17, AS
36648.343669  (Tue May 02, 2000 08:14:53 UTC) Sat PRN 3, El 25, Azm 162, SNR 13, AS, Parity Error
36648.343704  (Tue May 02, 2000 08:14:56 UTC) Sat PRN 3, El 25, Azm 162, SNR 16, AS
36648.343785  (Tue May 02, 2000 08:15:03 UTC) Sat PRN 3, El 25, Azm 162, SNR 0, Available
36648.343808  (Tue May 02, 2000 08:15:05 UTC) Sat PRN 3, El 25, Azm 162, SNR 0, Code Search
36648.344457  (Tue May 02, 2000 08:16:01 UTC) Sat PRN 3, El 25, Azm 162, SNR 0, Freq Acquire
36648.344503  (Tue May 02, 2000 08:16:05 UTC) Sat PRN 3, El 25, Azm 162, SNR 0, Code Search
36648.344549  (Tue May 02, 2000 08:16:09 UTC) Sat PRN 3, El 26, Azm 162, SNR 0, Freq Acquire
36648.344584  (Tue May 02, 2000 08:16:12 UTC) Sat PRN 3, El 26, Azm 162, SNR 19, AS
36648.352836  (Tue May 02, 2000 08:28:05 UTC) Sat PRN 6, El 9, Azm 37, SNR 0, Available
36648.352859  (Tue May 02, 2000 08:28:07 UTC) Sat PRN 6, El 9, Azm 37, SNR 11, AS, Parity Error
36648.352871  (Tue May 02, 2000 08:28:08 UTC) Sat PRN 6, El 9, Azm 37, SNR 13, AS
36648.353392  (Tue May 02, 2000 08:28:53 UTC) Sat PRN 31, El 0, Azm 0, SNR 0, Code Search
36648.354318  (Tue May 02, 2000 08:30:13 UTC) Sat PRN 31, El 5, Azm 186, SNR 0, Freq Acquire
36648.354364  (Tue May 02, 2000 08:30:17 UTC) Sat PRN 31, El 5, Azm 186, SNR 0, Code Search
36648.360394  (Tue May 02, 2000 08:38:58 UTC) Sat PRN 31, El 9, Azm 185, SNR 0, Freq Acquire
36648.360417  (Tue May 02, 2000 08:39:00 UTC) Sat PRN 31, El 9, Azm 185, SNR 0, Message Sync Detect
36648.360440  (Tue May 02, 2000 08:39:02 UTC) Sat PRN 31, El 9, Azm 185, SNR 0, Ephemeris Acquire
36648.360788  (Tue May 02, 2000 08:39:32 UTC) Sat PRN 31, El 9, Azm 185, SNR 20, AS
36648.361737  (Tue May 02, 2000 08:40:54 UTC) Sat PRN 31, El 9, Azm 185, SNR 11, AS, Parity Error
36648.361760  (Tue May 02, 2000 08:40:56 UTC) Sat PRN 31, El 9, Azm 185, SNR 9, AS
36648.361771  (Tue May 02, 2000 08:40:57 UTC) Sat PRN 31, El 9, Azm 185, SNR 9, AS, Parity Error
36648.361783  (Tue May 02, 2000 08:40:58 UTC) Sat PRN 31, El 9, Azm 185, SNR 0, Message Sync Detect
36648.361864  (Tue May 02, 2000 08:41:05 UTC) Sat PRN 31, El 9, Azm 185, SNR 0, Code Search
36648.362119  (Tue May 02, 2000 08:41:27 UTC) Sat PRN 6, El 5, Azm 34, SNR 12, AS, Parity Error
36648.362142  (Tue May 02, 2000 08:41:29 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Available
36648.362176  (Tue May 02, 2000 08:41:32 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.362489  (Tue May 02, 2000 08:41:59 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.362535  (Tue May 02, 2000 08:42:03 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.362582  (Tue May 02, 2000 08:42:07 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.362628  (Tue May 02, 2000 08:42:11 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.362732  (Tue May 02, 2000 08:42:20 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.362778  (Tue May 02, 2000 08:42:24 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.362859  (Tue May 02, 2000 08:42:31 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.362906  (Tue May 02, 2000 08:42:35 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.363033  (Tue May 02, 2000 08:42:46 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.363079  (Tue May 02, 2000 08:42:50 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.363149  (Tue May 02, 2000 08:42:56 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.363195  (Tue May 02, 2000 08:43:00 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.363241  (Tue May 02, 2000 08:43:04 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Freq Acquire
36648.363288  (Tue May 02, 2000 08:43:08 UTC) Sat PRN 6, El 5, Azm 34, SNR 0, Code Search
36648.363345  (Tue May 02, 2000 08:43:13 UTC) Sat PRN 6 no longer in use
36648.363507  (Tue May 02, 2000 08:43:27 UTC) Sat PRN 6, El 0, Azm 0, SNR 0, Code Search
36648.363693  (Tue May 02, 2000 08:43:43 UTC) Sat PRN 6 no longer in use
36648.365556  (Tue May 02, 2000 08:46:24 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Freq Acquire
36648.365602  (Tue May 02, 2000 08:46:28 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Code Search
36648.365845  (Tue May 02, 2000 08:46:49 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Freq Acquire
36648.365892  (Tue May 02, 2000 08:46:53 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Code Search
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36648.365996  (Tue May 02, 2000 08:47:02 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Freq Acquire
36648.366054  (Tue May 02, 2000 08:47:07 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Code Search
36648.366193  (Tue May 02, 2000 08:47:19 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Freq Acquire
36648.366250  (Tue May 02, 2000 08:47:24 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Code Search
36648.366297  (Tue May 02, 2000 08:47:28 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Freq Acquire
36648.366343  (Tue May 02, 2000 08:47:32 UTC) Sat PRN 31, El 12, Azm 184, SNR 0, Code Search
36648.367720  (Tue May 02, 2000 08:49:31 UTC) Sat PRN 16, El 25, Azm 269, SNR 0, Available
36648.367732  (Tue May 02, 2000 08:49:32 UTC) Sat PRN 16, El 25, Azm 269, SNR 0, Message Sync Detect
36648.367744  (Tue May 02, 2000 08:49:33 UTC) Sat PRN 16, El 25, Azm 269, SNR 0, Code Search
36648.367790  (Tue May 02, 2000 08:49:37 UTC) Sat PRN 16, El 25, Azm 269, SNR 0, Message Sync Detect
36648.367801  (Tue May 02, 2000 08:49:38 UTC) Sat PRN 16, El 25, Azm 269, SNR 23, AS
36648.367813  (Tue May 02, 2000 08:49:39 UTC) Sat PRN 16, El 25, Azm 269, SNR 23, AS, Parity Error
36648.367836  (Tue May 02, 2000 08:49:41 UTC) Sat PRN 16, El 25, Azm 269, SNR 23, AS
36648.367952  (Tue May 02, 2000 08:49:51 UTC) Sat PRN 3, El 40, Azm 155, SNR 0, Available
36648.367998  (Tue May 02, 2000 08:49:55 UTC) Sat PRN 3, El 40, Azm 155, SNR 14, AS, Parity Error
36648.368033  (Tue May 02, 2000 08:49:58 UTC) Sat PRN 3, El 40, Azm 155, SNR 16, AS
36648.368207  (Tue May 02, 2000 08:50:13 UTC) Sat PRN 3, El 40, Azm 155, SNR 10, AS, Parity Error
36648.368230  (Tue May 02, 2000 08:50:15 UTC) Sat PRN 3, El 40, Azm 155, SNR 0, Message Sync Detect
36648.368264  (Tue May 02, 2000 08:50:18 UTC) Sat PRN 3, El 40, Azm 155, SNR 0, Code Search
36648.368334  (Tue May 02, 2000 08:50:24 UTC) Sat PRN 3, El 40, Azm 155, SNR 0, Freq Acquire
36648.368380  (Tue May 02, 2000 08:50:28 UTC) Sat PRN 3, El 40, Azm 155, SNR 0, Code Search
36648.368982  (Tue May 02, 2000 08:51:20 UTC) Sat PRN 3, El 41, Azm 154, SNR 0, Freq Acquire
36648.369028  (Tue May 02, 2000 08:51:24 UTC) Sat PRN 3, El 41, Azm 154, SNR 0, Code Search
36648.369086  (Tue May 02, 2000 08:51:29 UTC) Sat PRN 3, El 41, Azm 154, SNR 0, Freq Acquire
36648.369121  (Tue May 02, 2000 08:51:32 UTC) Sat PRN 3, El 41, Azm 154, SNR 12, AS
36648.369156  (Tue May 02, 2000 08:51:35 UTC) Sat PRN 3, El 41, Azm 154, SNR 21, AS, Parity Error
36648.369202  (Tue May 02, 2000 08:51:39 UTC) Sat PRN 3, El 41, Azm 154, SNR 23, AS
36648.370707  (Tue May 02, 2000 08:53:49 UTC) Sat PRN 16, El 25, Azm 267, SNR 0, Available
36648.370718  (Tue May 02, 2000 08:53:50 UTC) Sat PRN 16, El 25, Azm 267, SNR 0, Message Sync Detect
36648.370730  (Tue May 02, 2000 08:53:51 UTC) Sat PRN 16, El 25, Azm 267, SNR 0, Code Search
36648.370776  (Tue May 02, 2000 08:53:55 UTC) Sat PRN 16, El 25, Azm 267, SNR 0, Message Sync Detect
36648.370788  (Tue May 02, 2000 08:53:56 UTC) Sat PRN 16, El 25, Azm 267, SNR 25, AS, Parity Error
36648.370811  (Tue May 02, 2000 08:53:58 UTC) Sat PRN 16, El 25, Azm 267, SNR 26, AS
36648.371748  (Tue May 02, 2000 08:55:19 UTC) Sat PRN 16, El 24, Azm 267, SNR 0, Available
36648.371760  (Tue May 02, 2000 08:55:20 UTC) Sat PRN 16, El 24, Azm 267, SNR 0, Message Sync Detect
36648.371771  (Tue May 02, 2000 08:55:21 UTC) Sat PRN 16, El 24, Azm 267, SNR 0, Code Search
36648.371818  (Tue May 02, 2000 08:55:25 UTC) Sat PRN 16, El 24, Azm 267, SNR 0, Message Sync Detect
36648.371829  (Tue May 02, 2000 08:55:26 UTC) Sat PRN 16, El 24, Azm 266, SNR 25, AS, Parity Error
36648.371852  (Tue May 02, 2000 08:55:28 UTC) Sat PRN 16, El 24, Azm 266, SNR 24, AS
36648.374144  (Tue May 02, 2000 08:58:46 UTC) Sat PRN 3, El 44, Azm 152, SNR 10, AS, Parity Error
36648.374156  (Tue May 02, 2000 08:58:47 UTC) Sat PRN 3, El 44, Azm 152, SNR 10, AS
36648.374179  (Tue May 02, 2000 08:58:49 UTC) Sat PRN 3, El 44, Azm 152, SNR 0, Message Sync Detect
36648.374190  (Tue May 02, 2000 08:58:50 UTC) Sat PRN 3, El 44, Azm 152, SNR 0, Available
36648.374202  (Tue May 02, 2000 08:58:51 UTC) Sat PRN 3, El 44, Azm 152, SNR 14, AS
36648.374746  (Tue May 02, 2000 08:59:38 UTC) Sat PRN 31, El 17, Azm 183, SNR 0, Freq Acquire
36648.374757  (Tue May 02, 2000 08:59:39 UTC) Sat PRN 3, El 44, Azm 152, SNR 12, AS, Parity Error
36648.374757  (Tue May 02, 2000 08:59:39 UTC) Sat PRN 31, El 17, Azm 183, SNR 0, Message Sync Detect
36648.374769  (Tue May 02, 2000 08:59:40 UTC) Sat PRN 3, El 44, Azm 152, SNR 0, Message Sync Detect
36648.374792  (Tue May 02, 2000 08:59:42 UTC) Sat PRN 3, El 44, Azm 152, SNR 0, Code Search
36648.374885  (Tue May 02, 2000 08:59:50 UTC) Sat PRN 31, El 17, Azm 183, SNR 0, Available
36648.374896  (Tue May 02, 2000 08:59:51 UTC) Sat PRN 31, El 17, Azm 183, SNR 19, AS, Parity Error
36648.374908  (Tue May 02, 2000 08:59:52 UTC) Sat PRN 31, El 17, Azm 183, SNR 18, AS
36648.375105  (Tue May 02, 2000 09:00:09 UTC) Sat PRN 3, El 45, Azm 152, SNR 0, Freq Acquire
36648.375116  (Tue May 02, 2000 09:00:10 UTC) Sat PRN 3, El 45, Azm 152, SNR 17, AS
36648.376447  (Tue May 02, 2000 09:02:05 UTC) Sat PRN 31, El 18, Azm 183, SNR 14, AS, Parity Error
36648.376505  (Tue May 02, 2000 09:02:10 UTC) Sat PRN 31, El 18, Azm 183, SNR 14, AS
36648.376517  (Tue May 02, 2000 09:02:11 UTC) Sat PRN 31, El 18, Azm 183, SNR 12, AS, Parity Error
36648.376551  (Tue May 02, 2000 09:02:14 UTC) Sat PRN 31, El 18, Azm 183, SNR 14, AS
36648.376725  (Tue May 02, 2000 09:02:29 UTC) Sat PRN 31, El 18, Azm 183, SNR 0, Available
====================

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Kohjin Yamada
Sent: Tuesday, May 02, 2000 5:22 AM
To: TAPR Special Interest Group
Cc: TAPR APRS SIG; AMSAT BB
Subject: [tacgps] Re: [amsat-bb] More on GPS S/A Going Away


SA set off at around 09:00 UTC May 2 !!!

I'm watching TAC32 shows the height stays within 1m now, big surprise.

Kohjin - JR1EDE
```

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20. [tacgps] GPS S/A Comments

From: "Eric A. Cottrell" <eac@shore.net>
Date: Tue, 02 May 2000 08:45:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81291-2000.05.02-08.47.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

I went out about 12 am EDT and did not notice much change. My Garmin 12xl
was showing about 69 to 80 feet EPE. Satellite geometry was alittle bad with
fewer satellite visible plus I am partly blocked in some directions.

There was a difference this morning with EPE readings of 14 to 30
feet on the 12xl! A few more satellites were usuable. I fired up my old
Garmin 45 and EPE read in the range of 47 to 70 feet. I can understand this
as it is a sequential reciever and I suspect does not have the overdetermined
solution of the 12xl.

It will be interesting to hook up my DGPS setup and see the effect.
I got a real expensive component DGPS (Kenwood TS-850, AEA CP-1, IBM
Thinkpad 365ED).

I plan at lunch to go outside and run around the parking lot at work and
see the numbers change on the GPS 8->. This is great!

It will be interesting to see how this effects navigation during my
trip out to Dayton, Ohio mid-month. Maybe see some of you out there.

73 Eric eac@shore.net WB1HBU

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21. [tacgps] PRN 27, 16, 22, 1, 25, 19, 18 SA off @ 08:00 5/2/2000

From: Brooke Clarke <brooke@pacific.net>
Date: Tue, 02 May 2000 07:53:18 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81302-2000.05.02-09.54.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello:

I looked at the raw data log and found that in the same second the above PRNs had SA turned off (status
flag A8 -> A0)
PRN 25 changed (status flag A8 -> 28) 8 minutes later.

What's the difference between A0 and 28?

08:00 UTC is midnight in the Pacific time zone, but why not UTC or some other time zone?

73,

Brooke - N6GCE

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22. [tacgps] Re: SA going away at midnight??

From: nolan@naic.edu (Mike Nolan)
Date: Tue, 2 May 2000 11:13:53 -0400 (AST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81307-2000.05.02-10.15.34--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

They're willing to give up SA ("selective availability") because,
besides th ease of jamming, the "bad guys" probably have access to
dual-frequency P-code receivers anyway, which give ca. 1m accuracy. So
having SA on degrades civilian use without appreciable military
benefit. The cheap commercial receivers that SA helps against have
other protections as well (like shutting off if they are going too fast
and too high).

The military do retain the ability to use AS ("anti-spoofing"), which
turns off the higher-accuracy mode except for those with Y-code
receivers, which doesn't include any civilian users. But AS doesn't
affect the L1 CA code that we're all using. I'm sure that in case of
serious military activity, they would just go ahead and turn SA back on
anyway.

-Mike

Mike Nolan <nolan@naic.edu>
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HC03 Box 53995, Arecibo, Puerto Rico 00612 USA

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23. [tacgps] Timing jitter reduction by elimination of SA

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 2 May 2000 10:56:18 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81363-2000.05.02-11.57.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Measurements last night using my "standard" Oncore VP6 receiver and the
ASCII output from my gps controller (this is the gps jitter averaged over
30 seconds):

SA ON (before 0700 UTC): 32 nsec rms

SA OFF (after 0800 UTC): 6.9 nsec rms

A nice improvement of more than a factor of 4!

Running the controller at N=5 resulted in a jitter into the
VCXO (i.e. after filtering) of 0.82 nsec SA ON, and 0.24 nsec SA OFF,
an improvement of about 3.5

The result of this is that it is now possible to run the controller
at a much shorter integration time to achieve a given level of frequency
stability. A shorter integration time means a VCXO with poorer
stability/temperature specs can be used, if necessary. Or looking at it
the other way around, much better stability is now possible with a good
VCXO.

Brooks

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24. [tacgps] Re: PRN 27, 16, 22, 1, 25, 19, 18 SA off @ 08:00 5/2/2000

From: Dave Martindale <davem@cs.ubc.ca>
Date: Tue, 02 May 2000 10:10:58 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81366-2000.05.02-12.10.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>08:00 UTC is midnight in the Pacific time zone, but why not UTC or some other time zone?

Actually, 7:00 UTC is currently midnight in the Pacific time zone, due to
daylight savings time. Maybe 8:00 UTC is midnight in Alaska?

>From reports on sci.geo.satellite-nav, with people watching the output of
GPS receivers, it seems that SA was actually turned off shortly after
midnight EDT (4:00 UTC). Now we see that the ephemeris data was updated

at 8:00 UTC. Why the 4 hour delay?

Maybe it just took that long for the control segment people on the ground
to verify that everything was working well before changing the flags.

Or maybe they were just using two different "midnights" as target times.
Turn down the clock dithering at midnight in the easternmost US timezone,
turn off the ephemeris flags at midnight in the westernmost (continental)
US timezone.

        Dave

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25. [tacgps] RE: Timing jitter reduction by elimination of SA

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 2 May 2000 12:19:42 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81367-2000.05.02-12.23.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Wonder what that will do for the new M12 ?

> ----------
> From: Brooks Shera[SMTP:ebs@lanl.gov]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, May 02, 2000 12:56 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Timing jitter reduction by elimination of SA
>
> Measurements last night using my "standard" Oncore VP6 receiver and the
> ASCII output from my gps controller (this is the gps jitter averaged over
> 30 seconds):
>
> SA ON (before 0700 UTC): 32 nsec rms
>
> SA OFF (after 0800 UTC): 6.9 nsec rms
>
> A nice improvement of more than a factor of 4!
>
> Running the controller at N=5 resulted in a jitter into the
> VCXO (i.e. after filtering) of 0.82 nsec SA ON, and 0.24 nsec SA OFF,
> an improvement of about 3.5
>
> The result of this is that it is now possible to run the controller
> at a much shorter integration time to achieve a given level of frequency
> stability. A shorter integration time means a VCXO with poorer
> stability/temperature specs can be used, if necessary. Or looking at it
> the other way around, much better stability is now possible with a good
> VCXO.
>
> Brooks
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

26. [tacgps] RE: Timing jitter reduction by elimination of SA

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 2 May 2000 11:45:19 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81369-2000.05.02-12.46.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>Wonder what that will do for the new M12 ?

Sadly, almost nothing.

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] RE: Timing jitter reduction by elimination of SA

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 2 May 2000 12:48:58 -0500

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81370-2000.05.02-12.52.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I was hoping for some gain - I seen it hit 1100 ns at one point.....

> ----------
> From: Brooks Shera[SMTP:ebs@lanl.gov]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, May 02, 2000 1:45 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Timing jitter reduction by elimination of SA
>
> >Wonder what that will do for the new M12 ?
>
> Sadly, almost nothing.
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

28. [tacgps] Nice results with HP 58503A

From: tvb@veritas.com (Tom Van Baak)
Date: Tue, 2 May 2000 11:19:06 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81373-2000.05.02-13.21.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Those of you with HP 58503A GPSDO receivers know that although
the daily and monthly stability is very good the 1 PPS output
can wander by tens of nanoseconds for times less than an hour.

But with SA gone see the nice results:

  http://www.leapsecond.com/sa/

Doug Hogarth posted similar results:
  http://www.niceties.com/atomic.html

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] S/A Turned Off @04:00 -- Initial Report

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Tue, 02 May 2000 20:17:58 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Doug Hogarth <dougho@niceties.com>,
        Chuck Kodak <Charles.Kodak@Honeywell-TSI.com>,
        John Bosworth <jmb@ltpmail.gsfc.nasa.gov>,
        John Degnan <jjd@ltpmail.gsfc.nasa.gov>,
        Bruce Schupler <Bruce.Schupler@Honeywell-TSI.com>,
        Ed Himwich <weh@ivscc.gsfc.nasa.gov>,
        Tom Clark <clark@tomcat.gsfc.nasa.gov>,
        Art Sepin <info@synergy-gps.com>, Rick Hambly <rick@cnssys.com>,
        Jim Read <jimread@earthlink.net>, Donna Bell <dbell_bcs@att.net>,
        Erricos Pavlis <epavlis@helmert.gsfc.nasa.gov>,
        Phil Karn <karn@qualcomm.com>, Larry Hothem <lhothem@USGS.GOV>,
        Richard Langley <lang@unb.ca>, John Rush <jrush@hq.nasa.gov>,
        Larry Young <ley@logos.jpl.nasa.gov>,
        Frank Bauer <frank.bauer@gsfc.nasa.gov>,
        John Franke <j.m.franke@larc.nasa.gov>,
        John LaBrecque <jlabrecq@hq.nasa.gov>, Tom Stansell <tom@stansell.com>,
        Reza Abtahi <reza@cnst.com>
Message-ID: <LYR6754-81383-2000.05.02-14.22.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Please pardon the wide fan-out, but a number of people asked similar
questions about last night's exciting party with DoD turning off S/A.

Rick Hambly reported that S/A was turned off last night at 08:00 UTC
based on the GPS status bits. I just took a look at the last week
of timing data between the Hydrogen Maser and one of my TAC-2 (Motorola
ONCORE VP) L1 timing receivers at the NASA Goddard Geophysical &
Astronomical Observatory (GGAO). The data shows that S/A was actually
turned off @ 04:00, meaning that Rick's status bit information was

conservative and lagged the actual GPS satellite re-configuration by
4 hours. This also means that the "midnight" in yesterday's press
release ended up referring to EDT.

I have posted two plots for your interest on my FTP site at URL
         ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_1.pdf
   and   ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_2.pdf

Plot 1 shows the past week of GGAO timing data (the units are all
in usec and times in UTC). The TAC-2 at GGAO uses Rick's TAC32Plus
software with an HP53131A Time-Interval Counter (I call the combo
the TIC-TAC!) to average individual one-second data over 5 minute
intervals and to remove the ONCORE's internal (+/- 52 nsec) sawtooth
dither. TAC32Plus maintains statistics on the RMS noise level of the
300 points in the 5 minute window, and on the max/min of the 300
individual measurements. Plot 2 is a zoomed view of the last day of
the plot 1.

On these plots, the Blue trace is the 5 minute average, and Red/Green
are the max/min extrema after removing a ~5.8e-13 Maser Offset rate
and ~11 usec maser-to-UTC Offset to produce an untrended, zero-mean
plot (i.e. the expected value for blue is zero). The orange line is
the internal (i.e. shorter than 5 minute) measurement RMS.

The event with S/A turning off @ 04:00 UTC is quite obvious. Before
S/A was turned off, excursions of +/- 100-150 nsec (the red/grn noise
around the blue average) were quite common. Prior to 04:00, the short
term internal noise level (orange) averaged ~16.4 nsec. The long term
noise level (i.e. variations around the zero mean) of the 5 minute
(blue) averages is 24.3 nsec.

It's only ~12 hours since S/A was turned off, but the effect on
timing is pretty spectacular, and is best viewed on Plot 2. The
(orange) 16.4 nsec RMS noise has decreased to 4.1 nsec. It's a bit
soon to discuss longer-term statistics, but the 5-minute (blue)
average now shows only 9.7 nsec of noise.

I am a bit perplexed that average (blue) is not centered between
the max/min (grn/red) traces (perhaps there is some heretofore
undiscovered ONCORE bias?).

All-in-all, the effect of turning S/A is quite spectacular,
especially for the "low-cost" timing community.

Regards, Tom

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30. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Richard Langley <lang@unb.ca>
Date: Tue, 2 May 2000 16:31:19 -0300 (ADT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TACGPS Group <tacgps@lists.tapr.org>,
        Time Transfer Working Group <TTWG@clockdev.usno.navy.mil>,
        Doug Hogarth <dougho@niceties.com>,
        Chuck Kodak <Charles.Kodak@Honeywell-TSI.com>,
        John Bosworth <jmb@ltpmail.gsfc.nasa.gov>,
        John Degnan <jjd@ltpmail.gsfc.nasa.gov>,
        Bruce Schupler <Bruce.Schupler@Honeywell-TSI.com>,
        Ed Himwich <weh@ivscc.gsfc.nasa.gov>,
        Tom Clark <clark@tomcat.gsfc.nasa.gov>,
        Art Sepin <info@synergy-gps.com>, Rick Hambly <rick@cnssys.com>,
        Jim Read <jimread@earthlink.net>, Donna Bell <dbell_bcs@att.net>,
        Erricos Pavlis <epavlis@helmert.gsfc.nasa.gov>,
        Phil Karn <karn@qualcomm.com>, Larry Hothem <lhothem@USGS.GOV>,
        John Rush <jrush@hq.nasa.gov>, Larry Young <ley@logos.jpl.nasa.gov>,
        Frank Bauer <frank.bauer@gsfc.nasa.gov>,
        John Franke <j.m.franke@larc.nasa.gov>,
        John LaBrecque <jlabrecq@hq.nasa.gov>, Tom Stansell <tom@stansell.com>,
        Reza Abtahi <reza@cnst.com>
Message-ID: <LYR6754-81391-2000.05.02-15.11.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks, Tom. Also have a look at the plot on the U.S. Space Command GPS
Support Center Web site confirming the 0400 UTC SA turn off
<http://www.spacecom.af.mil/usspacecom/gps_support/>.
-- Richard

On Tue, 2 May 2000, Dr Thomas A Clark (W3IWI) wrote:

>Please pardon the wide fan-out, but a number of people asked similar
>questions about last night's exciting party with DoD turning off S/A.
>
>
>Rick Hambly reported that S/A was turned off last night at 08:00 UTC
>based on the GPS status bits. I just took a look at the last week
>of timing data between the Hydrogen Maser and one of my TAC-2 (Motorola
>ONCORE VP) L1 timing receivers at the NASA Goddard Geophysical &
>Astronomical Observatory (GGAO). The data shows that S/A was actually
>turned off @ 04:00, meaning that Rick's status bit information was
>conservative and lagged the actual GPS satellite re-configuration by
>4 hours. This also means that the "midnight" in yesterday's press
>release ended up referring to EDT.
>
>I have posted two plots for your interest on my FTP site at URL
>   ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_1.pdf
>   and   ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_2.pdf
>
>Plot 1 shows the past week of GGAO timing data (the units are all
>in usec and times in UTC). The TAC-2 at GGAO uses Rick's TAC32Plus
>software with an HP53131A Time-Interval Counter (I call the combo
>the TIC-TAC!) to average individual one-second data over 5 minute
>intervals and to remove the ONCORE's internal (+/- 52 nsec) sawtooth
>dither. TAC32Plus maintains statistics on the RMS noise level of the
>300 points in the 5 minute window, and on the max/min of the 300
>individual measurements. Plot 2 is a zoomed view of the last day of
>the plot 1.
>
>On these plots, the Blue trace is the 5 minute average, and Red/Green
>are the max/min extrema after removing a ~5.8e-13 Maser Offset rate
>and ~11 usec maser-to-UTC Offset to produce an untrended, zero-mean
>plot (i.e. the expected value for blue is zero). The orange line is
>the internal (i.e. shorter than 5 minute) measurement RMS.
>
>
>The event with S/A turning off @ 04:00 UTC is quite obvious. Before
>S/A was turned off, excursions of +/- 100-150 nsec (the red/grn noise
>around the blue average) were quite common. Prior to 04:00, the short
>term internal noise level (orange) averaged ~16.4 nsec. The long term
>noise level (i.e. variations around the zero mean) of the 5 minute
>(blue) averages is 24.3 nsec.
>
>It's only ~12 hours since S/A was turned off, but the effect on
>timing is pretty spectacular, and is best viewed on Plot 2. The
>(orange) 16.4 nsec RMS noise has decreased to 4.1 nsec. It's a bit
>soon to discuss longer-term statistics, but the 5-minute (blue)
>average now shows only 9.7 nsec of noise.
>
>I am a bit perplexed that average (blue) is not centered between
>the max/min (grn/red) traces (perhaps there is some heretofore
>undiscovered ONCORE bias?).
>
>All-in-all, the effect of turning S/A is quite spectacular,
>especially for the "low-cost" timing community.
>
>Regards, Tom
>


```
================================================================================
 Richard B. Langley                            E-mail: lang@unb.ca
 Geodetic Research Laboratory                  Web: http://www.unb.ca/GGE/
 Dept. of Geodesy and Geomatics Engineering    Phone:    +1 506 453-5142
 University of New Brunswick                   Fax:      +1 506 453-4943
 Fredericton, N.B., Canada  E3B 5A3
     Fredericton?  Where's that?  See: http://www.city.fredericton.nb.ca/
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```



```
---
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```


31. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Tue, 02 May 2000 21:47:21 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TACGPS Group <tacgps@lists.tapr.org>,
Time Transfer Working Group <TTWG@clockdev.usno.navy.mil>,
Doug Hogarth <dougho@niceties.com>,
Chuck Kodak <Charles.Kodak@Honeywell-TSI.com>,
John Bosworth <jmb@ltpmail.gsfc.nasa.gov>,
John Degnan <jjd@ltpmail.gsfc.nasa.gov>,
Bruce Schupler <Bruce.Schupler@Honeywell-TSI.com>,
Ed Himwich <weh@ivscc.gsfc.nasa.gov>,
Tom Clark <clark@tomcat.gsfc.nasa.gov>,
Art Sepin <info@synergy-gps.com>, Rick Hambly <rick@cnssys.com>,
Jim Read <jimread@earthlink.net>, Donna Bell <dbell_bcs@att.net>,
Erricos Pavlis <epavlis@helmert.gsfc.nasa.gov>,
Phil Karn <karn@qualcomm.com>, Larry Hothem <lhothem@USGS.GOV>,
John Rush <jrush@hq.nasa.gov>, Larry Young <ley@logos.jpl.nasa.gov>,
Frank Bauer <frank.bauer@gsfc.nasa.gov>,
John Franke <j.m.franke@larc.nasa.gov>,
John LaBrecque <jlabrecq@hq.nasa.gov>, Tom Stansell <tom@stansell.com>,
Reza Abtahi <reza@cnst.com>
Message-ID: <LYR6754-81397-2000.05.02-15.49.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Richard Langley wrote:
>
> Thanks, Tom. Also have a look at the plot on the U.S. Space Command GPS
> Support Center Web site confirming the 0400 UTC SA turn off
> <http://www.spacecom.af.mil/usspacecom/gps_support/>.
> -- Richard

Thanks Richard -- hadn't looked at the SpaceCom page. Their plot tracks
my timing results quite well.

Tom

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32. [tacgps] RE: PRN 27, 16, 22, 1, 25, 19, 18 SA off @ 08:00 5/2/2000

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 2 May 2000 18:01:35 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81406-2000.05.02-17.03.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooke,

Assuming you are talking about a Motorola VP or UT:
 A8 => in use, anti-spoof flag set, inaccurate (SA)
 A0 => in use, anti-spoof flag set
 28 => not in use, anti-spoof flag set, inaccurate (SA)

Rick
WB2TNL

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Brooke Clarke
Sent: Tuesday, May 02, 2000 10:53 AM
To: TAPR Special Interest Group
Subject: [tacgps] PRN 27, 16, 22, 1, 25, 19, 18 SA off @ 08:00 5/2/2000

Hello:

I looked at the raw data log and found that in the same second the above PRNs had SA turned off (status
flag A8 -> A0) PRN 25
changed (status flag A8 -> 28) 8 minutes later.

What's the difference between A0 and 28?

08:00 UTC is midnight in the Pacific time zone, but why not UTC or some other time zone?

73,

Brooke - N6GCE

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---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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33. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: "Eric A. Cottrell" <eac@shore.net>
Date: Tue, 02 May 2000 22:25:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81446-2000.05.02-22.26.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>
> Richard Langley wrote:
> >
> > Thanks, Tom. Also have a look at the plot on the U.S. Space Command GPS
> > Support Center Web site confirming the 0400 UTC SA turn off
> > <http://www.spacecom.af.mil/usspacecom/gps_support/>.
> > -- Richard
>
> Thanks Richard -- hadn't looked at the SpaceCom page. Their plot tracks
> my timing results quite well.

Hello,

I got to get some more timing toys. Of course this also came so fast that
I doubt any of my timing toys would be setup. I keep the 12xl in the car
because I run APRS. I should have connected the 12xl to the computer for
at least a NMEA log but then I could not run around the yard.

I thought I noticed the position not shifting around as much after midnight
but I was trusting the EPE readings on my 12xl. I assume that they lowered
the URA figures when they flipped the SA status off. (Which means they could
turn SA on and not flip the SA status on as well). I seem to recall that
jitter is introduced into values in the broadcast data so the 4 hour delay could
be to make sure the old data sets with the jitter had expired.

I set my GPS units for decimal degrees as that setting seemed to have the most
resolution. It is neat to have only the lsd change by a count or two. It
is neat to walk south and have the latitude decrease and the longitude stay
steady, then walk east and have the latitude stay steady and the longitude
decrease. A step is about one LSD digit change so the effect of moving was
noticable. Walking around a parking lot holding two GPS units is behavior a
normal person would not understand 8->. The 45 position was a few lsd digits
off (about 12 to 24 feet) from the 12xl position (which I expected and is
reflected in the EPE on the 45). It is going to be interesting now as the
mouth of my driveway (some 37 feet away) is a different waypoint compared to
where my car is parked. I also noticed old waypoints are about a tenth of
a mile away from the new non-SA position as I did not average them for long.
I also notice that the waypoint position average does not work as well. The
number goes down alittle and changes as the EPE changes (it goes up as well
as down). So I guess the position average is a relic of the old SA days.

This evening I hooked up my Street Atlas 7.0 and got good results. The
arrow does not tend to wander and stays closer to the street you are on.
The arrow also seems to be pointing more closely to your direction of travel.
It is more noticable that some street segments on the map are alittle off and
they draw a straight segment between two intersections where the real street
curves. When I stopped for a light the position dot was at the right cross
street. I remember reading in the SA 7.0 docs that the accuracy
of the map data is 100 feet. IMHO eliminating SA has improved the usefulness
of mapping programs. Tomorrow I may put in a route to work, turn on the
voice and see how that does.

73 Eric eac@shore.net

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34. [tacgps] Re: Timing jitter reduction by elimination of SA

From: Tom Van Baak <tvb@elhaz.pair.com>
Date: Wed, 3 May 2000 14:30:13 -0400 (EDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81545-2000.05.03-13.31.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Brooks Shera <ebs@lanl.gov> wrote:
> Measurements last night using my "standard" Oncore VP6 receiver and the
> ASCII output from my gps controller (this is the gps jitter averaged over
> 30 seconds):
>
> SA ON (before 0700 UTC): 32 nsec rms
>
> SA OFF (after 0800 UTC): 6.9 nsec rms
>
> A nice improvement of more than a factor of 4!

Sounds good. I'm seeing a similar improvement, from 20 ns to 6.3 ns,
with an HP 58503A (a GPSDO containing an ONCORE).

Details and a couple more plots at:

  http://www.leapsecond.com/sa/#1DAY

/tvb

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35. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: "Ira A. Wilner" <bdcst@sover.net>
Date: Thu, 4 May 2000 00:51:29 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81619-2000.05.04-00.01.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

-----Original Message-----
From: Eric A. Cottrell <eac@shore.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Date: Tuesday, May 02, 2000 11:26 PM
Subject: [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

>
>This evening I hooked up my Street Atlas 7.0 and got good results. The
>arrow does not tend to wander and stays closer to the street you are on.

Well, I re-installed my GM-100 in my vehicle and can report that the
breadcrumb trail on the mapping display will retrace itself upon my return.
With SA this would not happen as the errors would always be great enough to
make the retrace deviate significantly from the original trail. Finally,
consumer grade GPS provides a feeling of trustworthiness due to
repeatability. About time too!

--Ira (W1IRA)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

36. [tacgps] Re: M12 - not ready for prime timing

From: Reg Clemens <reg@dwf.com>
Date: Thu, 04 May 2000 12:39:32 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81714-2000.05.04-13.41.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Since a lot of members of the group have picked up Synergy's M12
Evaluation kit, I have a/some questions...

Back on 21apr Brooks Shera noted

> I was primarily interested in the quality of the 1 pps timing output for
> controlling a frequency standard. The Motorola spec says the 1 pps
> output is within +/- 500 nsec of UTC. This may be correct but the timing
> of the 1 pps (even in position hold mode) jumps back and forth but

> several hundred nsec from 1 second to the next. In this respect the
> performance is about 10 times poorer than the Motorola UT. Of course the
> M12 was not billed as a timing receiver, but I had hopes that it would be
> better than it seems to be.

If anything Im seeing an order of magnitude worse than this.
My simplest test is to just watch the timestamps go by in the NTP clockstats
file, in a version of NTP that has a refclock_oncore driver that I have
updated for the M12 command set,
and for my VP, and a 350MHz Pentium II, with a standard (unstabalized)
Xtal, I see the last three digits (100s of ns) dance around from one
timestamp to the next. In addition to the jitter there is some lower
frequency effect and now and then the 1us digit will change, but it will
then stay put for a number of timestamps before changing...

OK, with the M12, same antenna, same Computer, same everything, things seem
3orders of magnitude worse. The digits that are bouncing around are now
the 3us digits, and every once in a while the 1ms digit will change.

I cant believe the M12 could REALLY be that much worse than a VP (or the
UT that Brooks compared against). Anyone have any ideas? Is this
a firmware problem? Am I doing something stupid? (Ive tried both 0D and
3Dmode, with not all that much difference).

Any thoughts/suggestions would be appreciated.

ALSO, there have been some comments that that the RM that is out there for
the M12 is at Rev 1.0 while the Firmware is at Rev 1.3, anyone know of an
adenda to update the manual? I dont see anything out on Synergy's site.
--
Reg.Clemens
reg@dwf.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] Re: M12 - not ready for prime timing

From: "Doug McKinney" <Design@mt.to>
Date: Thu, 4 May 2000 12:19:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81718-2000.05.04-14.21.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

----- Original Message -----
From: "Reg Clemens" <reg@dwf.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, May 04, 2000 11:39 AM
Subject: [tacgps] Re: M12 - not ready for prime timing

> Since a lot of members of the group have picked up Synergy's M12
> Evaluation kit, I have a/some questions...
>
> Back on 21apr Brooks Shera noted
>
> > I was primarily interested in the quality of the 1 pps timing output for
> > controlling a frequency standard. The Motorola spec says the 1 pps
> > output is within +/- 500 nsec of UTC. This may be correct but the timing
> > of the 1 pps (even in position hold mode) jumps back and forth but
> > several hundred nsec from 1 second to the next. In this respect the
> > performance is about 10 times poorer than the Motorola UT. Of course
the
> > M12 was not billed as a timing receiver, but I had hopes that it would
be
> > better than it seems to be.
>
> If anything Im seeing an order of magnitude worse than this.
> My simplest test is to just watch the timestamps go by in the NTP
clockstats
> file, in a version of NTP that has a refclock_oncore driver that I have
> updated for the M12 command set,
> and for my VP, and a 350MHz Pentium II, with a standard (unstabalized)
> Xtal, I see the last three digits (100s of ns) dance around from one
> timestamp to the next. In addition to the jitter there is some lower
> frequency effect and now and then the 1us digit will change, but it will
> then stay put for a number of timestamps before changing...

>
> OK, with the M12, same antenna, same Computer, same everything, things
seem
> 3orders of magnitude worse. The digits that are bouncing around are now
> the 3us digits, and every once in a while the 1ms digit will change.
>
> I cant believe the M12 could REALLY be that much worse than a VP (or the
> UT that Brooks compared against). Anyone have any ideas? Is this
> a firmware problem? Am I doing something stupid? (Ive tried both 0D and
> 3Dmode, with not all that much difference).
>
> Any thoughts/suggestions would be appreciated.

Yes, I have made a comment a week ago that the VP Xtal is no longer being
made and the few in stock are going to the UT+. The Xtal for the M12 is not
up to the standards of the VP Xtal. As the result, less accuracy in the M12
over the VP!! Tah Dah!!

Doug

>
> ALSO, there have been some comments that that the RM that is out there for
> the M12 is at Rev 1.0 while the Firmware is at Rev 1.3, anyone know of an
> adenda to update the manual? I dont see anything out on Synergy's site.
> --
>   Reg.Clemens
>   reg@dwf.com
>
>
>
> ---
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>

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38. [tacgps] Pack*BASH dinner at Dayton Hamvention 2000

From: John Ackermann <jra@febo.com> (by way of Greg Jones)
Date: Thu, 4 May 2000 14:27:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81722-2000.05.04-14.33.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dayton Activities

Attending the 2000 Dayton Hamvention? Then don't miss out on PACK*BASH!

What?
        An event for the digitally-inclined ham, featuring:
        * Buffet dinner
        * Keynote Address: "Amateur Radio and Submarine NR-1"
           by CDR Chas Richard, W4HFZ, USN
        * TAPR special interest group meetings
        * "Birds of a Feather" gatherings

When?
        Friday evening, May 19, 2000
        Doors open at 7:00 pm; dinner served at 7:30 pm
        Speaker and meetings after dinner

Where?
        NCR "Sugarcamp" Conference Center, 101 W. Schantz Ave. --
        South of downtown Dayton, just west of Main St. (Rt 48).
        Maps available on the TAPR web site (www.tapr.org) or at the
        TAPR booth.

How?
        Dinner requires advance registration and payment through TAPR.
        Tickets will be available at the TAPR booth on Friday, though

we strongly encourage registration <before> Hamvention. The cost
is $25.00 per person, tax and tip included.

All amateurs are welcome to attend, enjoy the speaker, and
particpate in the meetings, although only those purchasing a
dinner
can eat.

To register, contact:
PACK*BASH
c/o TAPR
8987-309 E. Tanque Verde Road #337
Tucson, AZ   85749-9399

Phone: (940) 383-0000
Fax: (940) 566-2544
Internet: tapr@tapr.org

Visa/Mastercard Accepted

Who?
PACK*BASH is co-sponsored by TAPR -- Tucson Amateur Packet
Radio,
the national leader in digital communication -- and the Miami
Valley FM Association, Dayton's packet radio club.

For more information (including maps), go to
http://www.tapr.org/tapr/html/dayton.html, or send email to
tapr@tapr.org.
You can request information via packet radio at BASH@W8APR.#DAY.OH.USA.N
OAM.

--
John Ackermann   N8UR
Dayton, Ohio, USA
jra@febo.com -- http://www.febo.com

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39. [tacgps] Magellan OEM 5000

From: "Alberto di Bene" <dibene@usa.net>
Date: Fri, 5 May 2000 4:24:6
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81901-2000.05.05-04.25.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello all, I am a newcomer to this reflector, and I have a
question for all of you.
I bought a few months ago an OEM 5000 GPS board, made
circa 1993 by Magellan, because someone had told me that
on the interface there were available the 1 pps signal derived
from the received signals from the satellites, with the accuracy
and stability of their Cesium clocks, +/- the SA.

I was intending to homebrew something similar to the Shera
project appeared in a past issue of QST.

I have been unable to find that 1 pps signal, however. It just seems
not to be present on the interface. But there is a hope.
A few pins do not have signal on them, as seen on the 'scope,
but they have traces on the PCB leading somewhere. My last hope
is that the 1 pps signal must be enabled by some command to the
GPS unit.

Can anybody shed some light on this ? Anybody on this list that
has experience with the Magellan OEM 5000 ? Thanks for any advice.

Alberto   I2PHD

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40. [tacgps] Trimble SK-8

From: mdmiller@fastlane.net
Date: Fri, 05 May 2000 04:44:21 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81902-2000.05.05-04.49.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am looking for a Trimble Sk-8. Does anyone on the list have a
recommendation for where to buy one? If anyone has one to trade, I have a
VP Oncore I am willing to swap for one.

73
Mark N5RFX

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41. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 06 May 2000 16:09:06 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82075-2000.05.06-20.17.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello All --

Ok, SA is off and we have seen the rather dramatic
improvement in position and timing repeatabilities that have
resulted. Good news all around.

I would like to know what, assuming I pick up an Oncore UT+,
throw it down on the bench (not too hard, of course ;-),
plug in the antenna, turn on the power and wait for it to
lock up and settle down, then what can I expect in terms of
ABSOLUTE clock accuracy??? How close to UTC will it be?

Does GPS speak UTC or UT1 or some other epoch?

        Thanks to all, de bob, WA4YPV

--

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----
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internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

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42. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Mon, 08 May 2000 03:22:23 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82374-2000.05.07-21.23.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob Smith asked:
>
> Hello All --
>
> Ok, SA is off and we have seen the rather dramatic
> improvement in position and timing repeatabilities that have
> resulted. Good news all around.
>
> I would like to know what, assuming I pick up an Oncore UT+,
> throw it down on the bench (not too hard, of course ;-),
> plug in the antenna, turn on the power and wait for it to
> lock up and settle down, then what can I expect in terms of
> ABSOLUTE clock accuracy??? How close to UTC will it be?
>
> Does GPS speak UTC or UT1 or some other epoch?
>

>   Thanks to all, de bob, WA4YPV

Let's answer the last item first. Intrinsically, the GPS system runs on its
own atomic time scale called GPS time. All of the AT times are based on the
definition that a particular hyperfine transition of Cesium defines a
frequency of 9,192,631,770 Hertz (see
http://tycho.usno.navy.mil/cesium.html).
The Time epoch for GPS time was defined so that GPS time = UTC on Jan.6,
1980 -- the "dawn" of the GPS era.

UT1 is a time that represents the real rotation of the earth -- we might
call it sundial time. At this time, the average UT1 rate differs from
atomic time by about 3 parts in 10e8. The rotating earth is an imprecise
clock and the rate is affected by a number of geophysical factors --
circulation in the molten "goo"
in earth's core, friction from solar and lunar tides, the circulation of
the earth's atmospher and ocean, etcetera. UT1 is determined by
high-accuracy radio astronomical measurements using a technique called Very
Long Baseline Interferometry (VLBI). You can learn a bit about VLBI by
following the entries on my group's web site at
   http://lupus.gsfc.nasa.gov/brochure/bintro.html

So at this point we have two totally different clocks -- Atomic time and
"sundial" time. The two are unified in Coordinated Universal Time (UTC).
UTC runs at the AT rate (i.e. defined by the 9.2 GHz Cesium transition) and
is stepped whenever an adjustment is needed to keep UT1 and UTC in step.
These leapseconds are inserted only on Jan.1 and July.1 and currently occur
about every 18 months. The the present time, UTC and GPS time are different
by 13 seconds that have accumulated since the 1980 "dawn".

Although GPS runs in its own AT scale (without leapseconds), each GPS
satellite sends the current GPS-to-UTC offset as a part of the 1500 bits
message sent at 50 bits/sec every 30 seconds. So nearly every GPS receiver
presents its time to the user as UTC.

Now to answer your initial question on the post-S/A timing accuracy with
the ONCORE UT+ -- it depends a bit on how you are using the receiver. The
are several questions that need to be answered:

- Is your receiver running to produce 3-D positions, or have
    you "locked" the position in what I've called "zero-D" mode?

   If: you are running with the receiver determining position and
   time, the inherent timing accuracy while S/A was active was
   300 nsec RMS, and it may have improved to ~200 nsec. You can
   see the 3-D vs Zero-D (with S/A) contrast in
      ftp://tac.gsfc.nasa.gov/pub/oso-d270.gif

- Else: Since you are running in Zero-D mode,so how are you using the
   timing data?

   If: you want to grab a single random pulse from the 1PPS output and
   use it "blind", then your accuracy will be dominated by the
   ONCORE's +/- 52 nsec sawtooth "dither". The pulse you might
   grab has this 104 nsec pk-to-pk noise like it did before S/A
   went off. Before S/A went off, this was about about the same
   magnitude as the S/A induced noise, and the resultant noise
   level was ~ 40-50 nsec RMS. Now that S/A is off, the sawtooth
   totally dominates the error with ~30 nsec RMS. You can see this
   dither in the plot on my FTP site at
        ftp://tac.gsfc.nasa.gov/pub/tac-1sec.gif

- Else: you are a more sophisticated user and work with multiple
  pulses. You might average the time between a local crystal (or
  atomic) over an interval like a minute. In this case, the "dither"
  sawtooth will average out. This will bring the short-term noise
  down to a few nsec!

- AND/OR: The ONCORE's binary data stream tells you about the sawtooth
  error. Applying this correction to each 1PPS measurement also
  reduces the sawtooth dither error to a few nsec RMS.

Earlier this week I posted two plots showing the pre/post-S/A
performance of an ONCORE VP at
       ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_1.pdf
  and ftp://tac.gsfc.nasa.gov/pub/tac32/SA_off_2.pdf

This data was taken in the last AND/OR mode with a VP, but
subsequent tests on a UT+ show similar results. We have found
some 5 nsec-level glitches in the ONCORE that were not noticeable
before S/A was turned off, but it is too early to report on the
details.

Bob -- your question asked about ACCURACY (i.e. how close does your local
clock reading match the Master Clock at the USNO), and what I've just
outlined is really related to PRECISON (i.e. smoothness). The documentation
I put out on my TAC and that Rick Hambly includes in TAC32 (see
http://www.cnssys.com) describes some of the other calibrations needed to
convert precision into timing accuracy. These factors include:

- Have you accounted for all the cables in your system? Remember that a 3'
piece of coax will delay the signal by about 5 nsec! The ONCORE allows you
to compensate for these biases, but you can't forget them!

- How well did you determine the fixed "Zero-D" position? An error of 0.001
arc minutes in Lat/Lon or a few meter in altitude will give a timing error
of a few nsec.

- How good are the ionospheric and tropospheric corrections in the
receivers we are using? How good are the ephemerides broadcast by the GPS
sateelites that are used by the receivers? I have some evidence that I'm
seeing 5-10 nsec amplitude diurnal (one cycle/day due to the atmosphere?)
and semi-diurnal (two cycles/day due to satellite ephemerides, multipath,
etc) biases, but it's too early to discuss them yet.

When all these factors are included, all indications are that the overall
ACCURACY (with the definition I've given above) of our low-cost timing
receivers can now be as good as 10 nsec. If you do nothing but turn it on,
the answer is ~200 nsec.

73, Tom

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43. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 07 May 2000 21:58:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82388-2000.05.07-22.00.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>

GREAT ANSWER. Pardon me for shouting, but that's worth shouting about.

...
> - How good are the ionospheric and tropospheric corrections in the
> receivers we are using? How good are the ephemerides broadcast by the GPS
> sateelites that are used by the receivers? I have some evidence that I'm
> seeing 5-10 nsec amplitude diurnal (one cycle/day due to the atmosphere?)
> and semi-diurnal (two cycles/day due to satellite ephemerides, multipath,
> etc) biases, but it's too early to discuss them yet.

I saw some intereting diurnal variations in some geodetic work I did
last year. I noted that my baseline solutions vice CORS reference
stations were demonstrating a really good correlation when the duration
of observation ranged from 4 to 11+ hours, but starting in the 12 hour
range (more than, not less than) and extending to about 17 or 18 hours
of observation on a single point, the noise of the solution increased
almost 2-fold. This was using precise ephemerides and clocks (not
solving for clocks) and all CORS sites, and solving for a set of
baselines and a final network solution point-position, again on a CORS
site. The software was Schenewerk's PAGES code (NGS). The
installations were all decent, although my "test point" (At the National
Balloon Launch Facility, Palestine TX) has some potential for multipath
due to its siting on the corner of a 10-ft chainlink fence overlooking a
windprofiler in the middle of 50-ft tall pines...

Any thoughts?

Regards,
Gerry
--

Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Geodesy
Computer Science Department |Satellite Geodesy and Control
Texas A&M University |
979.458.4020

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44. [tacgps] Timing at the 10 nsec level

From: "Robert H. Hamstra, Jr." <rhamstra@cirsol.com>
Date: Mon, 08 May 2000 00:09:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82433-2000.05.08-02.14.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/html

At 03:22 AM 5/8/00 +0100, Dr. Tom Clark wrote:

> ---- big snip -------

>

>When all these factors are included, all indications are that the
overall

>ACCURACY (with the definition I've given above) of our low-cost
timing

>receivers can now be as good as 10 nsec. If you do nothing but turn
it on,

>the answer is ~200 nsec.

>

>73, Tom

>

Tom,

I am uneasy with the figure of 10 nsec. It appears to be optimistic to
me

because of the underlying timing accuracies of the GPS clocks and the
limits

of the UTC agreement between the national labs both here in the US and

internationally. Using a two day average of GPS time USNO shows at

http://tycho.usno.navy.mil/gif/utcgps.gif <http://tycho.usno.navy.mil/gif/utcgps.gif>

a difference of about +/- 15 nsec between UTC(USNO) and GPS time
for

the last 30 days.

NIST (Boulder) measures the time difference between each GPS space
vehicle and

UTC(NIST). Daily averaged measurements are reported at

http://gpsmonitor.timefreq.bldrdoc.gov/gpstrace.htm
<http://gpsmonitor.timefreq.bldrdoc.gov/gpstrace.htm>

For 4 May to 6 May (after SA was turned off) NIST reports
differences of up to 20.2 nsec

between UTC(NIST) and individual PRN's. It also shows PRN 8 drifted a
full 15.7 nsec

over two days. This is one of the poor performing space vehicles.

Unfortunately UTC(NIST) and UTC(USNO) are not the same. BIPM Circular T
147

(2000 April 27) at

ftp://62.161.69.5/pub/tai/publication/cirt.147 <ftp://62.161.69.5/pub/tai/publication/cirt.147>

shows that UTC(NIST)-UTC(USNO) changed by 12 nsec between Feb 25 and Mar
31.

Also interesting is BIPM's measurement of GPS time which are
"measured at highest

elevation" and "corrected for precise satellite ephemerides and
for measured

ionospheric delays" reports UTC-GPS time varied from -30 nsec to +7
nsec

for the same time period.

I guess what I am saying is GPS time distribution with SA off is reaching
the limits of world

time keeping ability and when accuracy statements in the 10 nsec range
are made one

must be very careful to state the conditions of measurement.

This all brings up a question which I have been wondering about. With
detailed knowledge

about the performance of each PRN, as provided by NIST, does it make
sense to excluded

the poor performing PRN's if one is doing all-in-view zero-D
timing?

-Cheers, Bob

Robert H. Hamstra, Jr. - Circuit Solutions, San Jose, CA
95129

RHamstra@CirSol.com Voice: (408) 996-2166 Fax: (408)
446-9471

http://www.cirsol.com <http://www.cirsol.com/>

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45. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Bob Smith <bobsmith5@home.com>
Date: Mon, 08 May 2000 07:04:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82458-2000.05.08-06.05.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Many thanks to Dr. Tom Clark for pulling the many loose ends
of this puzzle into a coherent whole. I never cease to be
amazed by his lucidity and availability!

The short answer, as I understand it, if one does nothing
terribly special beyond taking it out of the box and turning
it on, is that the processed output of the GPS receiver
speaks UTC to an initial precision of about 200
nanoseconds. Thus, one could certainly claim
'sub-microsecond' accuracy for "GPS time" P.S. (Post SA).

        Many thanks and a tip of the hat to Dr. Clark

                73, de bob, wa4ypv - viva la TAPR

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46. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Tom Van Baak <tvb@elhaz.pair.com>
Date: Tue, 9 May 2000 06:00:12 -0400 (EDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82688-2000.05.09-05.01.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" <tac@clark.net> wrote:
...
> Let's answer the last item first. Intrinsically, the GPS system runs on its
> own atomic time scale called GPS time. All of the AT times are based on the
> definition that a particular hyperfine transition of Cesium defines a
> frequency of 9,192,631,770 Hertz (see
> The Time epoch for GPS time was defined so that GPS time = UTC on Jan.6,
> 1980 -- the "dawn" of the GPS era.
...

For a live clock showing local, UTC, GPS, Loran-C, and TAI
time scales see:

  http://www.leapsecond.com/java/gpsclock.htm

/tvb

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47. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: Bob Smith <bobsmith5@home.com>
Date: Tue, 09 May 2000 07:40:06 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82698-2000.05.09-06.41.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom -

That's a great reference with many interesting links. Thank
you!

        Bob Smith

Tom Van Baak wrote:
>
> "Dr Thomas A Clark (W3IWI)" <tac@clark.net> wrote:
> ...
> > Let's answer the last item first. Intrinsically, the GPS system runs on its
> > own atomic time scale called GPS time. All of the AT times are based on the
> > definition that a particular hyperfine transition of Cesium defines a
> > frequency of 9,192,631,770 Hertz (see
> > The Time epoch for GPS time was defined so that GPS time = UTC on Jan.6,
> > 1980 -- the "dawn" of the GPS era.
> ...
>
> For a live clock showing local, UTC, GPS, Loran-C, and TAI
> time scales see:
>
>   http://www.leapsecond.com/java/gpsclock.htm
>
> /tvb
>
> ---
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--

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48. [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

From: "ztn" <tienanzh@netease.com>
Date: Wed, 10 May 2000 22:26:38 +0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-82953-2000.05.10-09.28.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi All,

I am newer to TAPR Special Interest Group (tacgps@lists.tapr.org) , the first emails I received were Dr Thomas A Clark (W3IWI) 's reply and other relevant emails. Now I also have a problem about GPS time:

We use DGPS in one of our projects, both base and rover are NAVSTAR XR6, in this application the accuracy between rovers will no doubt be improved greatly. But how about the ABSOLUTE accuracy between rover and GPS time or UTC? I think it is also improved same as between rovers, assuming the base position is precise enough. But some of us do not agree with me, they said that absolute accuracy of rover do not improved and the absolute accuracy of rover is the same as single GPS positioning!
So my question is --- can DGPS improve the absolute time accuracy of GPS receiver?

Thanks All in advance,

Zheng

----- Original Message -----
From: Dr Thomas A Clark (W3IWI) <tac@clark.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Monday, May 08, 2000 10:22 AM
Subject: [tacgps] Re: S/A Turned Off @04:00 -- Initial Report

> Bob Smith asked:
> >
> > Hello All --
> >
> > Ok, SA is off and we have seen the rather dramatic
> > improvement in position and timing repeatabilities that have
> > resulted. Good news all around.
> >
> > I would like to know what, assuming I pick up an Oncore UT+,
 ....
> Let's answer the last item first. Intrinsically, the GPS system runs on its
> own atomic time scale called GPS time. All of the AT times are based on the
> definition that a particular hyperfine transition of Cesium defines a
> frequency of 9,192,631,770 Hertz (see
....

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49. [tacgps] Another effect of SA off

From: "Eric A. Cottrell" <eac@shore.net>
Date: Thu, 11 May 2000 06:53:41 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83143-2000.05.11-06.55.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

GPS is alot more useful with SA off. One effect I realized yesterday deals with track logs. I work about 12 miles or so from my home. I use several routes with alot of them twisting through urban streets.

When SA was on, I only got a track for the current trip to work and half of the trip home the previous day. When SA is off, I noticed that I had at least three tracks on the GPS because I used at least three routes these past few days.

The Garmin 12xl is set up for automatic intervals on the logging. It appears the drifting of SA ate up track points when stopped or moving slowly.

It is interesting to see the track logs. I enter the same driveway at work and the tracks there are right next to each other. The end points are different as I park in different spaces. This is neat.

73 Eric eac@shore.net WB1HBU

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

50. [tacgps] Re: [GPS] eases GPS

From: "Eric A. Cottrell" <eac@shore.net>
Date: Thu, 11 May 2000 19:20:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR TACGPS Mailing List <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83256-2000.05.11-19.21.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Edmund F Leavitt wrote:
> As far as artillery, Rockwell has produced a fuse that guides the
> Projectile in the latter half of its flight using GPS. That is no small
> technical accomplishment. Imagine building a really accurate and stable
> oscillator that has to work well after the monstrous G-forces of being
> slammed out of a cannon barrel. Then it has a few seconds to acquire the
> constellation and do its job. How they get an antenna to perform well
> while spinning madly, and while dropping out of the clouds toward its
> target? Neat stuff. I don't recall if they use C/A code or Y-code for
> those, but accuracy always counts in artillery, and CONSISTENCY counts
> even more. Do you suppose the COMSEC custodian gets chills thinking
> about shooting sensors all over the battlefield keyed with a CRYPTO
> Variable???

Hello,

Another amazing feat involved proximity fuses during WW2. They
had to develop methods so vacumm tubes would not break or fail
after being slammed out of a cannon barrel.

I suppose you could develop a system so the data required to
do a quick lock is uploaded to the shell before it is fired.
Alot easier to lock on a satellite if you know what satellites are visible,
the doppler to expect, the latest precision keplerian elements, and your
position.

73 Eric eac@shore.net WB1HBU

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

51. [tacgps] GPS & Radio Shack 2 & 4-way power dividers & amplifier

From: Brooke Clarke <brooke@pacific.net>
Date: Fri, 12 May 2000 13:37:18 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83406-2000.05.12-15.39.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Radio Shack has a number of components for Satellite TV systems that are
specified to work at GPS frequencies.

I recently got their 40-2050 MHz 4-way power divider p/n 16-2579 ($12.99) and
the 950-2050 MHz In-line amplifier 16-1156 ($9.99) and they are working great.
Note that the 4-way divider has two of the ouptputs configured to pass through
the DC power to the antenna (they think LNB), so my Motorola VP still powers the
GPS antenna. The In-line amplifier is rated for 14 - 18 V @ 18 - 40 ma, but I
am driving it with 4.91 V and it is still working well.

The insertion loss through the amplifier + 4-way divider combination is about 5
dB which puts out enough signal for the Garmin III+ to have signal strength bars
within 1/2 division of the top line and the TAC-32 software to show Motorola VP
about the middle of the 25dB Eb/No range (just a little lower than a direct
antenna connection).

You may also want to get some:
278-275 or 278-219 F(m-m) adapter between the amp and 4-way,
278-256 F(m) to BNC(f) adapters for the 4-way outputs & input to the amp (my
system had all BNC connectors to start)
15-1144 75 Ohm terminators for unused 4-way outputs

If there is interest I may make a web page for this combo.

73,

Brooke

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

52. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: Reg Clemens <reg@dwf.com>
Date: Fri, 12 May 2000 17:35:35 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83449-2000.05.12-18.37.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Back on 21apr2000, Brooks Shera <ebs@lanl.gov> noted (Refering to the M12)
the timing of the 1pps (even in position hold mode) jumps back and forth
several hundred ns from 1 second to the next.

On 4May2000 I <reg@dwf.com> responded that things looked a lot worse that that
to me.
That was about a day and a half after I received my M12 evaluation kit, and
well I should have taken some more time before responding, but I was pretty
happy to have ANYTHING working with NTP.

Something that SHOULD be noted, is that the 1pps pulse has the OPPOSITE
polarity from the 1pps pulse from the TAC2 board. If you just forge forward,
without pulling out the scope (actually I have little program that WOULD have
made this obvious IF I had run it) you will be timing on the wrong side of
the pulse and get REALLY BAD jitter.

OK, between that mistake, and something I will NEVER understand when I first
installed an additional Serial port on my PC so that I could run both the VP
and
the M12 on the same machine, I have some *really* strange results for the
first day
or two of testing.

After I finally had the serial port working correctly, and had discovered
the correct sign of the PPS pulse, THINGS STARTED TO LOOK A LOT BETTER.

Since I am interested in NTP, it is my experimental engine. I have added code
to NTP to run the M12 (and in the process, a lot of older units), but my main
debugging tool is to look at the data coming out on the clockstats file where
the timestamps for the individual ticks are recorded.

So what I am seeing is the time of arrival of the 1pps pulse, vs the PC clock
(I really DO need to upgrade the Xtal there), polluted by all the jitter
intrinsic
in the PC interrupts. To avoid problems of both 1pps pulses arriving at one
time,
the 1pps pulse from the VP was offset 100us in the VP, then the correction was
applied in the software.

OK, all that said, the M12 *REALLY DOESN'T LOOK ALL THAT BAD*.
I'm sure that measured as Brooks did, things look a lot worse than the VP/UT+,
but with the addition of the latencies in PC interrupts, the plots of the
M12 timestamps are only showing about x2 to x3 worse performance than the VP.

Measured with something other than a PC, the difference could easily be the
x10 that Brooks saw, but add PC interuups even on a 350MHz Pentium II, and
the difference is not that great. I suspect after the NTP PLL loop, that the
(relative) difference would be smaller, but I don't have any plots of that
yet.

And to answer a question before it is asked. I expect to be passing along the
M12 changes to the refclock_oncore.c driver to the NTP folks within a week or
so, so they should be incorporated in the CVS sources soon thereafter, and int
the actual release, sometime after that.

--
Reg.Clemens
reg@dwf.com

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53. [tacgps] Can DGPS improve the absolute time accuracy of rover receiver?

From: "ztn" <tienanzh@netease.com>
Date: Sat, 13 May 2000 22:39:16 +0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83553-2000.05.13-09.39.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,

We use DGPS in one of our projects, both base and rover are NAVSTAR XR6, in this application the time accuracy between rovers will no doubt be improved greatly. But how about the ABSOLUTE accuracy between rover and GPS time or UTC? I think it is also improved same as between rovers, assuming the base position is precise enough. But some of us do not agree with me, they said that absolute time accuracy of rover do not improved and the absolute time accuracy of rover is the same as single GPS positioning! So my question is --- can DGPS improve the absolute time accuracy of rover GPS receiver?

Thanks all!

Zheng

54. [tacgps] Re: Can DGPS improve the absolute time accuracy of rover receiver?

From: "Doug McKinney" <Design@mt.to>
Date: Sat, 13 May 2000 08:37:50 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83628-2000.05.13-15.54.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Interesting question. Timing accuracy is independent of position accuracy. For a given GPS receiver combination the timing accuracy is defined. When an RTCM104 DGPS correction is applied, the correction is only applied to the position data and none to timing data. Without timing data corrections in the RTCM104 data, I will assume that timing remains unaffected! SA affected both timing and position; DGPS affects only position.

Doug

> ----- Original Message -----
> From: ztn
> To: TAPR Special Interest Group
> Sent: Saturday, May 13, 2000 7:39 AM
> Subject: [tacgps] Can DGPS improve the absolute time accuracy of rover receiver?
>
> Hi all,
>
> We use DGPS in one of our projects, both base and rover are NAVSTAR XR6, in this application the time accuracy between rovers will no doubt be improved greatly. But how about the ABSOLUTE accuracy between rover and GPS time or UTC? I think it is also improved same as between rovers, assuming the base position is precise enough. But some of us do not agree with me, they said that absolute time accuracy of rover do not improved and the absolute time accuracy of rover is the same as single GPS positioning!
> So my question is --- can DGPS improve the absolute time accuracy of rover GPS receiver?
>
> Thanks all!
>
> Zheng

55. [tacgps] Re: Can DGPS improve the absolute time accuracy of rover receiver?

From: "ztn" <tienanzh@netease.com>
Date: Sun, 14 May 2000 09:57:20 +0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83661-2000.05.13-21.01.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Doug, but I think timing accuracy is not independent of position accuracy!
GPS use pseudorange for positioning, and pseudorange is time difference. In DGPS (RTCM104) rover must adjust its time to a uniform time as base for corrections and the rover time is also calculated endless, so assuming the base position is precise enough I think the base timing can transfer to rover and the rover timing accuracy can obtain the same. Specially in RTK mode, all the raw data are sent to rover for operance, it seems the rover time can get some advantage. I am not sure.

Best Regards,

Zheng

> ----- Original Message -----
> From: Doug McKinney
> To: TAPR Special Interest Group
> Sent: Saturday, May 13, 2000 11:37 PM
> Subject: [tacgps] Re: Can DGPS improve the absolute time accuracy of rover receiver?
>
> Interesting question. Timing accuracy is independent of position accuracy. For a given GPS receiver

combination the timing accuracy is defined. When an RTCM104 DGPS correction is applied, the correction is only applied to the position data and none to timing data. Without timing data corrections in the RTCM104 data, I will assume that timing remains unaffected! SA affected both timing and position; DGPS affects only position.

Doug
-----Original Message-----
From: ztn
To: TAPR Special Interest Group
Sent: Saturday, May 13, 2000 7:39 AM
Subject: [tacgps] Can DGPS improve the absolute time accuracy of rover receiver?

Hi all,

We use DGPS in one of our projects, both base and rover are NAVSTAR XR6, in this application the time accuracy between rovers will no doubt be improved greatly. But how about the ABSOLUTE accuracy between rover and GPS time or UTC? I think it is also improved same as between rovers, assuming the base position is precise enough. But some of us do not agree with me, they said that absolute time accuracy of rover do not improved and the absolute time accuracy of rover is the same as single GPS positioning!
So my question is --- can DGPS improve the absolute time accuracy of rover GPS receiver?

Thanks all!

Zheng

56. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Sun, 14 May 2000 15:10:31 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83826-2000.05.14-14.12.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Reg,

Thank you for discovering this. I have taken some timing data on the eval kit but always with the 1PPS on the RCA jack. I never noticed that the M12 eval kit was screwing up the time on my PC (using either NTP or Tac32/Tac32Plus). The PC time is really bad, not only because the sync is on the trailing edge of the 1PPS pulse, but because this edge is beyond the time data in the serial message. This makes the program sync using the wrong serial data!

Be careful how you choose to fix this. I have sent a message to Synergy that should result in a correction to the eval kit. Also, there is another M12 adapter board from Synergy that allows the M12 to plug into a VP/UT+ slot. I don't know if it has the same problem. In any case, do not assume that all M12's will have this bug, they won't! I guess an initialization option that allows for and inverted DCD is all that can be done. I will look into doing this for Tac32.

That said, the M12 is still really not all that good. If you want to use it to set the time on your PC, fine. If you are looking for the <10 nsec 1-sigma (post-SA) that can be obtained from a VP or UT+, forget it. Performance is more like +-0.800 microseconds with 450 nsec 1-sigma. Some VP data I have shows about +-0.070 microseconds and < 9 nsec 1-sigma for the same time period (post SA).

Rick
WB2TNL

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Reg Clemens
Sent: Friday, May 12, 2000 7:36 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

Back on 21apr2000, Brooks Shera <ebs@lanl.gov> noted (Refering to the M12) the timing of the 1pps (even in position hold mode) jumps back and forth several hundred ns from 1 second to the next.

On 4May2000 I <reg@dwf.com> responded that things looked a lot worse that that to me. That was about a day and a half after I received my M12 evaluation kit, and *well* I should have taken some more time before responding, but I was pretty happy to have ANYTHING working with NTP.

Something that SHOULD be noted, is that the 1pps pulse has the OPPOSITE
polarity from the 1pps pulse from the TAC2 board. If you just forge forward,
without pulling out the scope (actually I have little program that WOULD have
made this obvious IF I had run it) you will be timing on the wrong side of the
pulse and get REALLY BAD jitter.

OK, between that mistake, and something I will NEVER understand when I first
installed an additional Serial port on my PC so that I could run both the VP
and the M12 on the same machine, I have some *really* strange results for the
first day or two of testing.

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correct sign of the PPS pulse, THINGS STARTED TO LOOK A LOT BETTER.

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to NTP to run the M12 (and in the process, a lot of older units), but my main
debugging tool is to look at the data coming out on the clockstats file where
the timestamps for the individual ticks are recorded.

So what I am seeing is the time of arrival of the 1pps pulse, vs the PC clock
(I really DO need to upgrade the Xtal there), polluted by all the jitter
intrinsic in the PC interrupts. To avoid problems of both 1pps pulses
arriving at one time, the 1pps pulse from the VP was offset 100us in the VP,
then the correction was applied in the software.

OK, all that said, the M12 *REALLY DOESN'T LOOK ALL THAT BAD*. I'm sure that
measured as Brooks did, things look a lot worse than the VP/UT+, but with the
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Measured with something other than a PC, the difference could easily be the
x10 that Brooks saw, but add PC interuups even on a 350MHz Pentium II, and the
difference is not that great. I suspect after the NTP PLL loop, that the
(relative) difference would be smaller, but I don't have any plots of that
yet.

And to answer a question before it is asked. I expect to be passing along the
M12 changes to the refclock_oncore.c driver to the NTP folks within a week or
so, so they should be incorporated in the CVS sources soon thereafter, and int
the actual release, sometime after that.

--
                                        Reg.Clemens
                                        reg@dwf.com

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57. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: Reg Clemens <reg@dwf.com>
Date: Sun, 14 May 2000 13:34:52 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83835-2000.05.14-14.37.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Yes, I think that the answer is assume nothing.

I wrote a little program that writes out the ASSERT and CLEAR timestamps
from the PPSAPI, its probably 100 lines with tests and debug statements
for everything that could possibly go wrong down to the point where you
are actually getting timestamps.

In any case, on the VP the ASSERT timestamp comes 200ms before the CLEAR.
while on the M12, the CLEAR timestamp comes 200ms before the ASSERT.

If that had been the first piece of code I ran, I would have saved several
days of trying to figure out just what was going on (because as you note,
if you sync on the wrong edge, you are out in the middle of the response
message, so there is a good chance you will be choosing the WRONG response
message...

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58. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Mon, 15 May 2000 01:21:09 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Art Sepin <info@synergy-gps.com>
Message-ID: <LYR6754-83886-2000.05.14-19.23.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Without a schematic, the problem is probably that the U2 RS232
level converter is an inverter, and it's probably driven from
the "raw" 1PPS output from the M12. The correct scheme (like I did
on the TAC-2) would have been to put one inverter in this line.

I see a pretty simple temporary kludge solution:

a. Pull the jumper at JP1
b. From the pin of JP1 nearest U2/LT1381 and C4, run a 100
   or 220 ohm resistor to TP6, labelled 1PPS. This could
   just be a jumper wire, but a resistor will supply
   some isolation. Probably the cleanest place for the
   jumper is on the back-side of the board.

This will put the CMOS 0/+5V from U1/74AC04 driver onto
the DCD pin with the proper polarity. Normally you would
like to have a bipolar (-/+ voltage) signal for the RS232
interface, but 99% of the computer RS232 ports work just
fine with 0/+5V CMOS levels.

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

59. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Sun, 14 May 2000 21:27:01 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "Art Sepin" <info@synergy-gps.com>
Message-ID: <LYR6754-83891-2000.05.14-20.28.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I fixed mine without the compromise in Tom's solution.

1. Attach a wire between pins 11-12 on U1 (they are connected together with a
top side trace) and pin 11 of U2, using the nearby via hole that connects the
top side trace from U2 pin 11 to a bottom side trace.

2. Cut the bottom side trace that connects U2 pin 11 to R4.

I wanted to do this job neatly with a tiny piece of wire wrap wire for the
jumper on the bottom of the board. To do this I drilled a #70 hole close to
the trace connecting U1 pins 11 and 12. I used an xacto knife to scrape the
solder mask from this tiny trace. I put the wire through the hole and soldered
one end to the exposed trace.

The other end of the wire was soldered into the via hole leading to pin 11 of
U2 and the bottom trace leading away from that hole was cut.

By doing this you will have the full RS-232 levels and your 1PPS will be the
correct polarity. Everything else will still work properly, including the
1PPS LED.

Rick
WB2TNL

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Dr Thomas A Clark
(W3IWI)
Sent: Sunday, May 14, 2000 8:21 PM

To: TAPR Special Interest Group
Cc: Art Sepin
Subject: [tacgps] Re: M12 - Not ready for prime timing (the saga
continues)

Without a schematic, the problem is probably that the U2 RS232
level converter is an inverter, and it's probably driven from
the "raw" 1PPS output from the M12. The correct scheme (like I did
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the DCD pin with the proper polarity. Normally you would
like to have a bipolar (-/+ voltage) signal for the RS232
interface, but 99% of the computer RS232 ports work just
fine with 0/+5V CMOS levels.

73, Tom

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---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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60. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: "Jim King" <king@sstar.com>
Date: Mon, 15 May 2000 00:00:07 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83939-2000.05.15-00.02.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rick, thanks for the nifty instructions.

I don't have specs handy for the chips on the eval board. Could you
describe what your patch is doing, i.e. are you using a spare line driver or
something?

Does anybody know if Synergy will be willing to provide updated boards to
folks who have already bought the eval kit?

Jim

Richard M. Hambly wrote:
> I fixed mine without the compromise in Tom's solution.
>
> 1. Attach a wire between pins 11-12 on U1 (they are connected together
with a
> top side trace) and pin 11 of U2, using the nearby via hole that connects
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> one end to the exposed trace.
>
> The other end of the wire was soldered into the via hole leading to pin 11
of

> U2 and the bottom trace leading away from that hole was cut.
>
> By doing this you will have the full RS-232 levels and your 1PPS will be
the
> correct polarity. Everything else will still work properly, including the
> 1PPS LED.
>
> Rick
> WB2TNL
>
>
> -----Original Message-----
> From: bounce-tacgps-5621@lists.tapr.org
> [mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Dr Thomas A Clark
> (W3IWI)
> Sent: Sunday, May 14, 2000 8:21 PM
> To: TAPR Special Interest Group
> Cc: Art Sepin
> Subject: [tacgps] Re: M12 - Not ready for prime timing (the saga
> continues)
>
>
>
> Without a schematic, the problem is probably that the U2 RS232
> level converter is an inverter, and it's probably driven from
> the "raw" 1PPS output from the M12. The correct scheme (like I did
> on the TAC-2) would have been to put one inverter in this line.
>
> I see a pretty simple temporary kludge solution:
>
> a. Pull the jumper at JP1
> b. From the pin of JP1 nearest U2/LT1381 and C4, run a 100
>   or 220 ohm resistor to TP6, labelled 1PPS. This could
>   just be a jumper wire, but a resistor will supply
>   some isolation. Probably the cleanest place for the
>   jumper is on the back-side of the board.
>
> This will put the CMOS 0/+5V from U1/74AC04 driver onto
> the DCD pin with the proper polarity. Normally you would
> like to have a bipolar (-/+ voltage) signal for the RS232
> interface, but 99% of the computer RS232 ports work just
> fine with 0/+5V CMOS levels.
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: RICK@CNSSYS.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
> ---
> You are currently subscribed to tacgps as: king@sstar.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

61. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: Reg Clemens <reg@dwf.com>
Date: Mon, 15 May 2000 02:44:55 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83960-2000.05.15-03.47.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just a note, if you are using the M12 eval kit to drive NTP there is no
real problem (once you realize the pulse is inverted). The code defaults
to ASSERT, but can just as easily set it to CLEAR and it will time off
of the opposite polarity transition.
--
                                        Reg.Clemens
                                        reg@dwf.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org

To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

62. [tacgps] Re: M12 - Not ready for prime timing (the saga continues)

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Mon, 15 May 2000 06:56:02 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-83981-2000.05.15-05.57.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim,

The M12 Eval board appears to take the M12 1PPS and send it through 2
inverters to buffer it. The output feed both the RS232 driver, which does
another inversion, and the 1PPS LED circuit.

My modification directs the output of the first inverter to the RS232 driver
instead of using the output from the second inverter. The second inverter
still powers the 1PPS LED.

Rick

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Jim King
Sent: Monday, May 15, 2000 1:00 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: M12 - Not ready for prime timing (the saga
continues)

Rick, thanks for the nifty instructions.

I don't have specs handy for the chips on the eval board. Could you
describe what your patch is doing, i.e. are you using a spare line driver or
something?

Does anybody know if Synergy will be willing to provide updated boards to
folks who have already bought the eval kit?

Jim

Richard M. Hambly wrote:
> I fixed mine without the compromise in Tom's solution.
>
> 1. Attach a wire between pins 11-12 on U1 (they are connected together
with a
> top side trace) and pin 11 of U2, using the nearby via hole that connects
the
> top side trace from U2 pin 11 to a bottom side trace.
>
> 2. Cut the bottom side trace that connects U2 pin 11 to R4.
>
> I wanted to do this job neatly with a tiny piece of wire wrap wire for the
> jumper on the bottom of the board. To do this I drilled a #70 hole close
to
> the trace connecting U1 pins 11 and 12. I used an xacto knife to scrape
the
> solder mask from this tiny trace. I put the wire through the hole and
soldered
> one end to the exposed trace.
>
> The other end of the wire was soldered into the via hole leading to pin 11
of
> U2 and the bottom trace leading away from that hole was cut.
>
> By doing this you will have the full RS-232 levels and your 1PPS will be
the
> correct polarity. Everything else will still work properly, including the
> 1PPS LED.
>
> Rick
> WB2TNL
>
>
> -----Original Message-----
> From: bounce-tacgps-5621@lists.tapr.org
> [mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Dr Thomas A Clark
> (W3IWI)

> Sent: Sunday, May 14, 2000 8:21 PM
> To: TAPR Special Interest Group
> Cc: Art Sepin
> Subject: [tacgps] Re: M12 - Not ready for prime timing (the saga
> continues)
>
>
>
> Without a schematic, the problem is probably that the U2 RS232
> level converter is an inverter, and it's probably driven from
> the "raw" 1PPS output from the M12. The correct scheme (like I did
> on the TAC-2) would have been to put one inverter in this line.
>
> I see a pretty simple temporary kludge solution:
>
> a. Pull the jumper at JP1
> b. From the pin of JP1 nearest U2/LT1381 and C4, run a 100
>   or 220 ohm resistor to TP6, labelled 1PPS. This could
>   just be a jumper wire, but a resistor will supply
>   some isolation. Probably the cleanest place for the
>   jumper is on the back-side of the board.
>
> This will put the CMOS 0/+5V from U1/74AC04 driver onto
> the DCD pin with the proper polarity. Normally you would
> like to have a bipolar (-/+ voltage) signal for the RS232
> interface, but 99% of the computer RS232 ports work just
> fine with 0/+5V CMOS levels.
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: RICK@CNSSYS.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
> ---
> You are currently subscribed to tacgps as: king@sstar.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: RICK@CNSSYS.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

63. [tacgps] Lost control of the list

From: Jim Johnson <jim_johnson@agilent.com>
Date: Tue, 16 May 2000 13:52:32 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84317-2000.05.16-15.55.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Greetings,

   It looks like TAPR has lost control of the tacgps list. I was
trying to change my account address but I can't send commands to
the list controller because it does not accept my current return
address. Looks like a Catch 22 situation. When you send the
HELP command to listproc@tapr.org you get pointed to Lyris, which looks
like a several-hundred-page document that I don't have time to read.
In the few minutes that I did waste reading the "manual", I did not
find an address of a human to which I could ask about my situation.
Has anybody else had difficulty with this or is it just me?

   Instead of changing my account address, it looks like my only
option is to completely quit my current account and sign up over
again with the new address. Under the "old" way (before Lyris),
it was straightforward to change your account address. Not anymore.
Any suggestions are welcome. Thanks.

73,
Jim W6SC

--

Jim Johnson
jim_johnson@agilent.com
Agilent Laboratories
"Innovating the HP Way"
www.labs.agilent.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

64. [tacgps] RE: Lost control of the list

From: "Steven R. Bible" <steveb@dandin.com>
Date: Tue, 16 May 2000 18:52:17 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84330-2000.05.16-17.54.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Greetings,
>
>   It looks like TAPR has lost control of the tacgps list. I was
> trying to change my account address but I can't send commands to
> the list controller because it does not accept my current return
> address. Looks like a Catch 22 situation. When you send the
> HELP command to listproc@tapr.org you get pointed to Lyris, which looks
> like a several-hundred-page document that I don't have time to read.
> In the few minutes that I did waste reading the "manual", I did not
> find an address of a human to which I could ask about my situation.
> Has anybody else had difficulty with this or is it just me?
>
>   Instead of changing my account address, it looks like my only
> option is to completely quit my current account and sign up over
> again with the new address. Under the "old" way (before Lyris),
> it was straightforward to change your account address. Not anymore.
> Any suggestions are welcome. Thanks.

Jim,

For every TAPR list there is a list administrator. For this list that is
me. If you have problems such as this, all it takes is a polite message to
the list and I'll help you out.

To answer your question, if you navigate to the Lyris web page from the TAPR
home page (click on "TAPR Lists" link) then click on "Special Interests
Groups" then click on "TAC-2 & Technical GPS Issues" aka TACGPS list. From
here you can type in your email address and your password. From there you
can click on "Your Settings" and change your email address. If you go there
now, I have already cahnged you email to jim_johnson@agilent.com.

The above sounds like a mouthfull, but it is easily navigated by clicking on
links. The administration of Lyris is 100 times easier than the old lists
manager.

- Steve, N7HPR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

65. [tacgps] RE: Lost control of the list

From: Jim Johnson <jim_johnson@agilent.com>
Date: Tue, 16 May 2000 16:13:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84332-2000.05.16-18.15.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve,

   Please accept my apologies for sounding short with my message. I was
in a hurry and thought this would be easy. Once you know the "trick", as
you just described to me, I'm sure it will be simple to do. As a first
time user of Lyris, you can see how daunting it can be when you see the
depth of the menu system. It's also nice to see that a real person is
watching things and responds quickly to problems. Thank you for handling

my situation immediately and I hope others are helped by my little
outburst (more than irritated).

73 and thanks again,
Jim W6SC

"Steven R. Bible" wrote:
>
> > Greetings,
> >
> >   It looks like TAPR has lost control of the tacgps list. I was
> > trying to change my account address but I can't send commands to
> > the list controller because it does not accept my current return
> > address. Looks like a Catch 22 situation. When you send the
> > HELP command to listproc@tapr.org you get pointed to Lyris, which looks
> > like a several-hundred-page document that I don't have time to read.
> > In the few minutes that I did waste reading the "manual", I did not
> > find an address of a human to which I could ask about my situation.
> > Has anybody else had difficulty with this or is it just me?
> >
> >   Instead of changing my account address, it looks like my only
> > option is to completely quit my current account and sign up over
> > again with the new address. Under the "old" way (before Lyris),
> > it was straightforward to change your account address. Not anymore.
> > Any suggestions are welcome. Thanks.
>
> Jim,
>
> For every TAPR list there is a list administrator. For this list that is
> me. If you have problems such as this, all it takes is a polite message to
> the list and I'll help you out.
>
> To answer your question, if you navigate to the Lyris web page from the TAPR
> home page (click on "TAPR Lists" link) then click on "Special Interests
> Groups" then click on "TAC-2 & Technical GPS Issues" aka TACGPS list. From
> here you can type in your email address and your password. From there you
> can click on "Your Settings" and change your email address. If you go there
> now, I have already cahnged you email to jim_johnson@agilent.com.
>
> The above sounds like a mouthfull, but it is easily navigated by clicking on
> links. The administration of Lyris is 100 times easier than the old lists
> manager.
>
> - Steve, N7HPR
>
> ---
> You are currently subscribed to tacgps as: jim_johnson@agilent.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

  Jim Johnson
  jim_johnson@agilent.com
  Agilent Laboratories
  "Innovating the HP Way"
  www.labs.agilent.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

66. [tacgps] Lyris

From: Jim Johnson <jim_johnson@agilent.com>
Date: Tue, 16 May 2000 16:29:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84334-2000.05.16-18.32.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Greetings again,

   Now I see where I went wrong. I sent HELP to listproc@tapr.org
and this is what I got back:

  "Help is available at the Lyris Web Site: http://www.lyris.com/help"

   So I clicked on the link and could find nothing about TACGPS or TAPR,
by navigating or by using their search block. I tried sending a message
to paul@eye.psych.umn.edu and received no answer. Then I got frustrated.

So my data was very old (on how to get help) but Steve Bible set me straight and I hope everybody else who reads this list follows his directions to get to list administration issues. If I'm the only one who just learned this, sorry to waste your time.

Thanks,
Jim W6SC

--

Jim Johnson
jim_johnson@agilent.com
Agilent Laboratories
"Innovating the HP Way"
www.labs.agilent.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

67. [tacgps] NTP 4.0.99i, TAC-2, Oncore UT+ & SCO OpenServer 5.0.5

From: "Scott O'Connell" <scotto@sds.com>
Date: Wed, 17 May 2000 1:38:48
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84428-2000.05.17-01.40.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've ordered a TAC-2 w/Oncore UT+. I have compiled NTP 4.0.99i and have it running on an SCO OpenServer 5.0.5 machine.

Is there anyone that has done this that might want to give me any pointers specific to SCO?

Thanks in advance!

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

68. [tacgps] Location problem for mentally disabled

From: "Frank Leslie" <frankleslie@hotmail.com>
Date: Fri, 19 May 2000 17:18:45 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84872-2000.05.19-16.20.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A wilderness trip leader is looking for a means of locating a lost person who may be not fully cooperative (injured, etc.). She indicates that the person may be somewhat unable to communicate, as she says the condition may have been referred to as "retarded" in the past. I believe the person might be autistic, but don't have further info.

So the requirements seem to be:
Device doesn't require the person to operate it, just carry it,

Position fixing to perhaps 100 -200 feet might be enough for visual or audible search.

Person is unlicensed for amateur service

Light weight battery load

Loss of radio link initiates alarm

At the moment, I think this is a questionable plan, but I'm thinking of something like GPS for a tracking dog, perhaps police canine patrol or searcher. GPS magazine just had something like this.

Has anyone had experience with this type of application? Comments and suggestions will be welcomed.

Frank Leslie,

fleslie@bigfoot.com
_____
Get Your Private, Free E-mail from MSN Hotmail at http://www.hotmail.com

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

69. [tacgps] Re: Location problem for mentally disabled

From: tvb@veritas.com (Tom Van Baak)
Date: Fri, 19 May 2000 14:59:51 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84877-2000.05.19-17.01.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Frank Leslie writes:
> A wilderness trip leader is looking for a means of locating a lost person
> who may be not fully cooperative (injured, etc.). She indicates that the
> person may be somewhat unable to communicate, as she says the condition may
> have been referred to as "retarded" in the past. I believe the person might
> be autistic, but don't have further info.
>
> So the requirements seem to be:
> Device doesn't require the person to operate it, just carry it,
>
> Position fixing to perhaps 100 -200 feet might be enough for visual or
> audible search.
>
> Person is unlicensed for amateur service
>
> Light weight battery load
>
> Loss of radio link initiates alarm
>
> At the moment, I think this is a questionable plan, but I'm thinking of
> something like GPS for a tracking dog, perhaps police canine patrol or
> searcher. GPS magazine just had something like this.
>
> Has anyone had experience with this type of application? Comments and
> suggestions will be welcomed.

Yes! In my days of wilderness trip leading we called the
device a "friend" or a "buddy". The way it worked was that
you paired the kids up by twos and had one look after the
other. No license required. No batteries. Occasional food
and water were necessary. Besides preventing lost individuals
the pairing also builds trust, responsibility, friendship,
and memories. ;-)

/tvb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

70. [tacgps] Re: Location problem for mentally disabled

From: "Steve Sampson" <ssampson@usa-site.net>
Date: Fri, 19 May 2000 21:57:34 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84894-2000.05.19-22.00.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Get one of those air-horns-in-a-can they sell, and put it in
their knapsack.

When I was 13 (aren't all 13 year olds mentally disabled?) I went
on a camping trip in Oregon. I wanted one last photo of the water
fall, and I thought a great shot would be from the edge of the hill,
out and down from the main camp. Since each group had an adult
to watch over every barracks, I first had to sneak away from him.
I figured it would take an hour at most. Succeeding in that I took
up a vector I was sure would allow me the best shot.

After about 10 minutes of walking (vectoring left and right to go
around fallen trees etc) I had the realization that I no longer knew
which was my original heading, nor the heading to backtrack.
Nothing but forest in every direction. I never made it to the part
that slopes down to the falls. Don't panic, I thought. Looking for
the sun didn't help, it was low scud and overcast. Crap, think
man, use your skills. I listened hard for the waterfall. Sat there
for about 15 minutes trying to come up with a plan. There's no
moss on the trees, there's no trail. I am screwed.

I remembered an old movie where the guy marked a tree as he
proceeded through the forest. Lot of good that does me now.
But I'll mark one to prevent me going in circles.

Then it happened. The P.A. system at the base camp went off
with the chow call. A bugle retreat. I was deep enough into the
forest that it was just a muffled sound. But when you're one
with nature, the non-natural stands out. That was it. Saved
my ass. I told our barracks warden about my stupid move.
He just stood there in shock. He told me they lost a kid about
five years earlier, he's still out there somewhere. Cat food no
doubt. He said his life just passed before his eyes. Told me
not to tell anyone, and then went and told the Commandant
about the great new P.A. system for bugle calls!

Funny thing is, I miss that completely lost feeling. I'm going to
have to do it again when I retire. The experience was life
changing. Maybe spend a few years trying to get out of the
Willamette National Forest :-)

Steve

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

71. [tacgps] OCXO

From: mdmiller@fastlane.net
Date: Sat, 20 May 2000 11:45:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-84998-2000.05.20-12.01.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does any one know of a source for purchasing a single new or used OXCO?

Thanks
Mark Miller
N5RFX

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

72. [tacgps] Re: OCXO

From: Glenn Little <glittle@awod.com>
Date: Sat, 20 May 2000 16:34:15 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85052-2000.05.20-15.46.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark

What frequency??

73

Glenn
WB4UIV

At 11:45 AM 5/20/00 -0500, you wrote:
>Does any one know of a source for purchasing a single new or used OXCO?
>
>Thanks
>Mark Miller
>N5RFX
>
>
>---
>You are currently subscribed to tacgps as: GLITTLE@AWOD.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

----
Glenn Little   glittle@awod.com   QCWA LM 28417
Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

73. [tacgps] RE: OCXO

From: William E Van Buskirk <wevb@nfis.com>
Date: Sun, 21 May 2000 09:24:28 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85148-2000.05.21-08.26.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Mark,
 I have a Isotemp 10MHz OCXO, model # OCXO118-12. They have a trim cap for
manual adj and an 8VDC ref voltage. I'm using one in a GPS /Frequency
standard project based on the design by Brooks Shera. If your interested
let me know.
Bill, KB0ODJ

On Saturday, May 20, 2000 12:46, mdmiller@fastlane.net
[SMTP:mdmiller@fastlane.net] wrote:
> Does any one know of a source for purchasing a single new or used OXCO?
>
> Thanks
> Mark Miller
> N5RFX
>
>
> ---
> You are currently subscribed to tacgps as: wevb@nfis.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

74. [tacgps] post porcessing software

From: Mathias Tobler <bagi@stars.ch>
Date: Sun, 21 May 2000 15:49:25 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85163-2000.05.21-12.27.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am looking for a cheap (better free) software that can post process RINEX
data. Pseudorange is sufficient even though carrier phase would be nice.
Any ideas?
What accuracy can I expect using pseudorange data only (e.g. from a M12)?

Thanks,

Mathias

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

75. [tacgps] Re: post porcessing software

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 21 May 2000 19:10:31 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85211-2000.05.21-19.13.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mathias Tobler wrote:
>
> I am looking for a cheap (better free) software that can post process RINEX
> data. Pseudorange is sufficient even though carrier phase would be nice.
> Any ideas?
> What accuracy can I expect using pseudorange data only (e.g. from a M12)?

Try this: I've tried it but I've not done much with it. It comes from
the National Geodetic Survey and has (obviously) no warranty. In what
I've seen going thru the code it looks like it'll do what you want for
carrier-phase processing.

You should be able to get 10-30 cm with it but I've not proven that

out. Do isolated baselines including known fiducial (control) points,
forming a geometric network. Then adjust the network using the method
of least squares, constraining the fiducial points to minimal adjustment
and the unknown point(s) to maximal adjustment. Adjust the whole
network at one time, if you can.

73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Geodesy
Computer Science Department |Satellite Geodesy and Control
Texas A&M University |
979.458.4020

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76. [tacgps] Re: post porcessing software

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 21 May 2000 19:32:32 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85213-2000.05.21-19.35.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mathias Tobler wrote:
>
> I am looking for a cheap (better free) software that can post process RINEX
> data. Pseudorange is sufficient even though carrier phase would be nice.
> Any ideas?
> What accuracy can I expect using pseudorange data only (e.g. from a M12)?

I don't know if my earlier messages made it thru: Netscape and I are
arguing tonight.

This piece of fortran code will do double-differencing processing.
Using a pair of control points (known coordinates) and processing
baselines between each control point and the unknown point will allow
you to create a triangular network that can readily be adjusted using
the method of least squares. The resulting answer should be within the
10-30cm range.

Sned me direct e-mail with further questions.

Disclaimer: This code is on my list but I've not used it extensively
yet. It's going to form the basis of what I hope to make a World
Bank-funded project.

73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Geodesy
Computer Science Department |Satellite Geodesy and Control
Texas A&M University |
979.458.4020
[Attachment: ddpr1.for; application/octet-stream; 83,188 bytes]

77. [tacgps] GPS Surveying

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 22 May 2000 9:37:51
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85291-2000.05.22-09.40.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Found a pdf book on line that has a lot of good info. Navstar GPS
Surveying EM1110-1-1003 from the Army Corp of Engineers. Its 328 pages and
4.1 Mb. Located at
http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-1-1003/toc.htm

---
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78. [tacgps] DGPS accuracy

From: Scott Tillman <dpseng@primenet.com>
Date: Mon, 22 May 2000 11:00:47 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85375-2000.05.22-13.03.20--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

So we all know that the accuracy of the basic GPS receiver
has improved since SA has been turned off, but has that
effected the results of a differential corrected receiver??

scott   k7ysv@iname.com

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79. [tacgps] RE: DGPS accuracy

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 22 May 2000 13:05:45 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85377-2000.05.22-13.09.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have two Oncore VPs and a M12. When the VP generates DGPS, the other VP
tracks it very tightly, usually within a meter over 15 minutes.

Ironically when the DGPS it sent to a Garmin 12XL, the EPE goes up say from
17 to 30. But if you look at the plot, its still tracking tighter than non
DGPS.

> ----------
> From: Scott Tillman[SMTP:dpseng@primenet.com]
> Reply To: TAPR Special Interest Group
> Sent: Monday, May 22, 2000 1:00 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] DGPS accuracy
>
> So we all know that the accuracy of the basic GPS receiver
> has improved since SA has been turned off, but has that
> effected the results of a differential corrected receiver??
>
>
> scott   k7ysv@iname.com
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

80. [tacgps] Re: DGPS accuracy

From: Gerry Creager <gerry@cs.tamu.edu>
Date: Mon, 22 May 2000 14:35:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85396-2000.05.22-14.37.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Scott Tillman wrote:
>
> So we all know that the accuracy of the basic GPS receiver
> has improved since SA has been turned off, but has that
> effected the results of a differential corrected receiver??

Little. There's going to be some improvement because clocks are
nominally better (unless you're using an M12 ;-) but most of the error
introduced by SA was eliminated by DGPS.

Gerry
--
Gerry Creager | Never ascribe to Malice that
Computer Science Department | which can adequately be
Texas A&M University | explained by Stupidity.
979.458.4020 (Phone) | -- Lazerus Long
979.847.8578 (Fax)

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81. [tacgps] RE: OCXO

From: Dan Hinz <dan.hinz@ieee.org>
Date: Mon, 22 May 2000 18:20:20 -0700

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85448-2000.05.22-20.22.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I purchased mine here:

http://tech-services.com/equip.htm

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82. [tacgps] Re: OCXO

From: Bill Broadley <bill@sphere.math.ucdavis.edu>
Date: Mon, 22 May 2000 20:23:28 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85469-2000.05.22-22.25.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Sat, May 20, 2000 at 11:45:39AM -0500, mdmiller@fastlane.net wrote:
> Does any one know of a source for purchasing a single new or used OXCO?

Please excuse the novice question.

Could this be used to improve the accuracy of a normal PC that's time
synced with a GPS?

I'd love to replace the lousy crystal on my motherboard with something
a bit more accurate....

Has anyone done similiar?

--
Bill

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83. [tacgps] Re: OCXO

From: Henry Lesovsky <lexmd@earthlink.net>
Date: Mon, 22 May 2000 21:05:40 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85473-2000.05.22-23.07.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Replacing the xtal on the PC won't help the accuracy
issue. The problem is one of interrupt processing;
the system used in both the MAC and PC.
Les Lesovsky in Alhambra, CA

Bill Broadley wrote:

> On Sat, May 20, 2000 at 11:45:39AM -0500, mdmiller@fastlane.net wrote:
> > Does any one know of a source for purchasing a single new or used OXCO?
>
> Please excuse the novice question.
>
> Could this be used to improve the accuracy of a normal PC that's time
> synced with a GPS?
>
> I'd love to replace the lousy crystal on my motherboard with something
> a bit more accurate....
>
> Has anyone done similiar?
>
> --
> Bill
>
> ---
> You are currently subscribed to tacgps as: lexmd@earthlink.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

84. [tacgps] Re: DGPS accuracy

From: Jeff <barnie@flash.net>
Date: Tue, 23 May 2000 06:56:39 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85563-2000.05.23-08.59.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've collected and analyzed about a week's worth of data
in several configurations although I still have several yet
to test. From what I have, I can draw a few conclusions.
I believe that in the best case of very short update intervals
(like 1 message/2 seconds) on the RTCM message, DGPS
without SA is unchanged vs. with SA. For more realistic
update rates on amateur radio links like 1 message/10
seconds, there may be some small improvement without SA.
 I do not yet have quantitative data on that.

What I base this on is the fact that my Garmin receiver gets
about 9m accuracy (95% confidence level) with DGPS in
the field (baselines of a couple miles) and the same number
in a zero-baseline test (rover and reference on the same
antenna with a splitter). This latter case eliminated nearly
all sources of error including multipath. About the only errors
left are front-end receiver noise. If I run a ZB test with my
two VP Oncores, I get a 1 m accuracy so the errors with
the Garmin are entirely in that unit. This implies the Garmin
in a DGPS mode has its variability defined by its own noise,
not by the GPS signal itself.

>From what I am seeing, without SA, the Garmins get the same
RMS noise with and without DGPS, but the mean position for
long-term averages has a 3-4 m bias without DGPS and a 7-9m
elevation bias without DGPS. It appears the real benefit to
DGPS now is true accuracy, not reduction of SA noise. The
normal GPS signal now appears to have some *very* long-term
correlation to it so that averaging has very little benefit now (at
most a 3:1 improvement now vs. something like 50:1 with SA on).

My setup is a VP Oncore and TAPR DGPS RTCM board
as the master station, running off a Lowe antenna on my
antenna tower. The antenna is on an 18x24" aluminum
ground plane which is above all local obstructions. I have a
Garmin GPS 40 and a second VP Oncore as rover receivers.
I occasionally borrow a Garmin 12XL for testing. I do all
my evaluations using Stan Huntting's SA Watch program
together with Excel, PC DSP, and SpectraPlus for advanced
analysis.

Jeff Vollin

Scott Tillman wrote:

> So we all know that the accuracy of the basic GPS receiver
> has improved since SA has been turned off, but has that
> effected the results of a differential corrected receiver??
>
> scott   k7ysv@iname.com
>
> ---
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---
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85. [tacgps] Re: DGPS accuracy

From: Dave Martindale <davem@cs.ubc.ca>
Date: Tue, 23 May 2000 09:49:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85599-2000.05.23-11.51.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>What I base this on is the fact that my Garmin receiver gets
>about 9m accuracy (95% confidence level) with DGPS in
>the field (baselines of a couple miles) and the same number
>in a zero-baseline test (rover and reference on the same
>antenna with a splitter).... If I run a ZB test with my
>two VP Oncores, I get a 1 m accuracy so the errors with
>the Garmin are entirely in that unit. This implies the Garmin
>in a DGPS mode has its variability defined by its own noise,
>not by the GPS signal itself.

Which Garmin receiver was this? You mention that you have a
GPS 40 (old single channel receiver) and sometimes borrow a
12XL (new 12-channel receiver), but which one gives you 9 m?

My own experiments with DGPS from a Coast Guard beacon suggest
that the old garmin receivers (GPS 20, 45XL in my case, same
receiver as the 40) are *much* noisier than the newer 12-channel
receivers (12XL, GPS 25LP).

        Dave

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86. [tacgps] Supplier for Motorola UT+

From: Bob Smith <bobsmith5@home.com>
Date: Tue, 23 May 2000 17:50:58 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85653-2000.05.23-16.53.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My interest is in precision timing, not so much positioning.

With the M12 falling out of favor for timing applications, I
am wondering about sources of supply for the Moto UT+ which
seems to be the leader of the pack in the post-SA era (and
probably was pre-SA).

        Bob Smith

--

--------- Avoid computer viruses -- Practice safe hex
----
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

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87. [tacgps] Re: Supplier for Motorola UT+

From: Reg Clemens <reg@dwf.com>
Date: Tue, 23 May 2000 16:59:39 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85669-2000.05.23-18.49.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Well I assume Synergy still has some units, but

> With the M12 falling out of favor for timing applications,

The M12 in its current incarnation was not MEANT to be a timing
receiver, so the fact that it doesnt do as well as the old VP/UT
boards is not surprising. I suspect different firmware would go
a long way towards closing the gap.

So, IF you are going to be using the VP/UT/M12 with a PC, timestamping
the PPS transitions, (like NTP does) then the M12 is not THAT much
worse than the better units. Unless you have an OS that I dont know
about, the latencies (actually variability in latencies) in answering the
interrupts overshadows the M12's problems, and the M12 is only x2 - x3
worse than the VP. If you are measuring the PPS signal some other way,

then it could be x10 worse...

--
Reg.Clemens
reg@dwf.com

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88. [tacgps] Re: Supplier for Motorola UT+

From: "Doug McKinney" <Design@mt.to>
Date: Tue, 23 May 2000 18:03:53 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85691-2000.05.23-20.06.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob, TAPR has about 8 UT+ in stock (they had about 8 unsold at Dayton).

Doug

----- Original Message -----
From: "Bob Smith" <bobsmith5@home.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, May 23, 2000 2:50 PM
Subject: [tacgps] Supplier for Motorola UT+

>
> My interest is in precision timing, not so much positioning.
>
> With the M12 falling out of favor for timing applications, I
> am wondering about sources of supply for the Moto UT+ which
> seems to be the leader of the pack in the post-SA era (and
> probably was pre-SA).
>
> Bob Smith
>
>
> --
>
> --------- Avoid computer viruses -- Practice safe hex
> -------------
> * * Specializing in small, cost effective embedded control
> systems * *
> Robert L. (Bob) Smith Smith Machine Works, Inc.
> internet   bobsmith5@home.com 9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia
> 23236+1004
>
> ---
> You are currently subscribed to tacgps as: KC3RL@MCKTECH.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

89. [tacgps] Re: DGPS accuracy

From: Jeff <barnie@flash.net>
Date: Tue, 23 May 2000 19:11:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85707-2000.05.23-21.14.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The 9m was based on the GPS40. I found the 12XL to be
quieter as you suggest. It came in about 6m in the same
zero baseline test. The VP Oncore is still much quieter
at 1m.

Dave Martindale wrote:

> >What I base this on is the fact that my Garmin receiver gets
> >about 9m accuracy (95% confidence level) with DGPS in

> >the field (baselines of a couple miles) and the same number
> >in a zero-baseline test (rover and reference on the same
> >antenna with a splitter).... If I run a ZB test with my
> >two VP Oncores, I get a 1 m accuracy so the errors with
> >the Garmin are entirely in that unit. This implies the Garmin
> >in a DGPS mode has its variability defined by its own noise,
> >not by the GPS signal itself.
>
> Which Garmin receiver was this? You mention that you have a
> GPS 40 (old single channel receiver) and sometimes borrow a
> 12XL (new 12-channel receiver), but which one gives you 9 m?
>
> My own experiments with DGPS from a Coast Guard beacon suggest
> that the old garmin receivers (GPS 20, 45XL in my case, same
> receiver as the 40) are *much* noisier than the newer 12-channel
> receivers (12XL, GPS 25LP).
>
>   Dave
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

90. [tacgps] RE: DGPS accuracy

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Wed, 24 May 2000 03:42:53 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85717-2000.05.23-21.45.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> I have two Oncore VPs and a M12. When the VP generates DGPS, the other
> VP tracks it very tightly, usually within a meter over 15 minutes.
>
> Ironically when the DGPS it sent to a Garmin 12XL, the EPE goes up say
> from 17 to 30. But if you look at the plot, its still tracking tighter
> than non DGPS.

Brian -- the EPE is calculated on the basis of the geometry of
the satellites actually used in the solution.

When enough satellites with DGPS corrections are available the
Garmin (and most other receivers) revert to a mode where they
only use the satellites for which corrections are available.
On the Garmin bar-graph S-Meter, these are the satellites with
a "D" at the bottom.

The Garmin is a 12-channel unit, and often at mid-latitudes we have
11-12 satellites in view. But the Oncore that is generating the DGPS
signals is only an 8-channel unit. Hence there can be up to 4
more satellites being tracked by the Garmin. These extra satellites
would improve the HDOP/PDOP (by which EPE is calculated) if
corrections were available.

This lack of enough channels is one of the problems with the
Oncore, and is the reason that some of us hope that a cost-effective
12-channel DGPS base station solution becomes available.

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

91. [tacgps] Re: OXCO

From: Bob Johnson <bobj@atlantic.net>
Date: Tue, 23 May 2000 23:05:49 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: bill@sphere.math.ucdavis.edu
Message-ID: <LYR6754-85724-2000.05.23-22.09.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>From: Bill Broadley <bill@sphere.math.ucdavis.edu>
>Date: Mon, 22 May 2000 20:23:28 -0700
>X-Message-Number: 6
>
>On Sat, May 20, 2000 at 11:45:39AM -0500, mdmiller@fastlane.net wrote:
>> Does any one know of a source for purchasing a single new or used OXCO?
>
>Please excuse the novice question.
>
>Could this be used to improve the accuracy of a normal PC that's time
>synced with a GPS?
>
>I'd love to replace the lousy crystal on my motherboard with something
>a bit more accurate....
>
>Has anyone done similiar?
>
>--
>Bill

The usual approach is to connect the GPS as a time reference to
the computer, and then use an NTP (Network Time Protocol) program
to read the GPS time at intervals and adjust the system clock to
match it. Both BSD and Linux systems can do this, I suspect that
by now someone has software to do it for at least some varieties
of Windows. You can keep the system clock accurate to a small
fraction of a second this way. I don't have a reference to
details on how to do it handy, though, but the program is "xntpd".
It also turns your system into an NTP server so that other
computers on your network can accurately set their time from
it.

-- Bob

+--
| Bob Johnson
| bobj@atlantic.net
+--

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92. [tacgps] Re: Supplier for Motorola UT+

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 24 May 2000 06:43:03 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85807-2000.05.24-06.46.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I know Synergy also has some refurbed Oncore VPs.

> ----------
> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, May 23, 2000 8:03 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
> Bob, TAPR has about 8 UT+ in stock (they had about 8 unsold at Dayton).
>
> Doug
>
> ----- Original Message -----
> From: "Bob Smith" <bobsmith5@home.com>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Tuesday, May 23, 2000 2:50 PM
> Subject: [tacgps] Supplier for Motorola UT+
>
>
> >
> > My interest is in precision timing, not so much positioning.
> >
> > With the M12 falling out of favor for timing applications, I
> > am wondering about sources of supply for the Moto UT+ which

> > seems to be the leader of the pack in the post-SA era (and
> > probably was pre-SA).
> >
> > Bob Smith
> >
> >
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> > --------- Avoid computer viruses -- Practice safe hex
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> > internet   bobsmith5@home.com 9900 Lumlay Road
> > landline   804/745-1065   Richmond, Virginia
> > 23236+1004
> >
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

93. [tacgps] Re: Supplier for Motorola UT+

From: "Doug McKinney" <Design@mt.to>
Date: Wed, 24 May 2000 08:55:40 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85841-2000.05.24-10.58.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

RE: [tacgps] Re: Supplier for Motorola UT+I heard that they had gotten a hold of a few VP's! Considering the VP's attributes; timing, DGPS and carrier phase abilities, it maybe worth getting another VP. I'll have to give Art a call.

Doug

  ----- Original Message -----
  From: Kirby, Brian
  To: TAPR Special Interest Group
  Sent: Wednesday, May 24, 2000 4:43 AM
  Subject: [tacgps] Re: Supplier for Motorola UT+

  I know Synergy also has some refurbed Oncore VPs.

    From: Doug McKinney[SMTP:Design@mt.to]
    Reply To: TAPR Special Interest Group
    Sent: Tuesday, May 23, 2000 8:03 PM
    To: TAPR Special Interest Group
    Subject: [tacgps] Re: Supplier for Motorola UT+

    Bob, TAPR has about 8 UT+ in stock (they had about 8 unsold at Dayton).

    Doug

    ----- Original Message -----
    From: "Bob Smith" <bobsmith5@home.com>
    To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
    Sent: Tuesday, May 23, 2000 2:50 PM
    Subject: [tacgps] Supplier for Motorola UT+

    >
    > My interest is in precision timing, not so much positioning.
    >
    > With the M12 falling out of favor for timing applications, I
    > am wondering about sources of supply for the Moto UT+ which
    > seems to be the leader of the pack in the post-SA era (and
    > probably was pre-SA).
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

94. [tacgps] Re: Supplier for Motorola UT+

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 24 May 2000 10:59:10 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85843-2000.05.24-11.02.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I ordered one yesterday - $232. They have put a new oscillator in them.

> ----------
> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 10:55 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
> I heard that they had gotten a hold of a few VP's! Considering the VP's
> attributes; timing, DGPS and carrier phase abilities, it maybe worth
> getting another VP. I'll have to give Art a call.
>
> Doug
>
>
>   ----- Original Message -----
>   From: Kirby, Brian
>   To: TAPR Special Interest Group
>   Sent: Wednesday, May 24, 2000 4:43 AM
>   Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
>   I know Synergy also has some refurbed Oncore VPs.
>
>   ----------
>   From: Doug McKinney[SMTP:Design@mt.to]
>   Reply To: TAPR Special Interest Group
>   Sent: Tuesday, May 23, 2000 8:03 PM
>   To: TAPR Special Interest Group
>   Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
>   Bob, TAPR has about 8 UT+ in stock (they had about 8 unsold
> at Dayton).
>
>   Doug
>
>   ----- Original Message -----
>   From: "Bob Smith" <bobsmith5@home.com>
>   To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
>   Sent: Tuesday, May 23, 2000 2:50 PM
>   Subject: [tacgps] Supplier for Motorola UT+
>
>
>   >
>   > My interest is in precision timing, not so much positioning.

>   >
>   > With the M12 falling out of favor for timing applications, I
>   > am wondering about sources of supply for the Moto UT+ which
>   > seems to be the leader of the pack in the post-SA era (and
>   > probably was pre-SA).
>   >
>   > Bob Smith
>   >
>   >
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> leave-tacgps-6754G@lists.tapr.org
>
>

95. [tacgps] Re: Supplier for Motorola UT+

From: "Doug McKinney" <Design@mt.to>
Date: Wed, 24 May 2000 09:05:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85845-2000.05.24-11.07.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

RE: [tacgps] Re: Supplier for Motorola UT+Hum, the old oscillator was the good part about the VP! Is the new oscillator an improvement or just a replacement?

Doug
  ----- Original Message -----
  From: Kirby, Brian
  To: TAPR Special Interest Group
  Sent: Wednesday, May 24, 2000 8:59 AM
  Subject: [tacgps] Re: Supplier for Motorola UT+

  I ordered one yesterday - $232. They have put a new oscillator in them.

    From: Doug McKinney[SMTP:Design@mt.to]
    Reply To: TAPR Special Interest Group
    Sent: Wednesday, May 24, 2000 10:55 AM
    To: TAPR Special Interest Group
    Subject: [tacgps] Re: Supplier for Motorola UT+

    I heard that they had gotten a hold of a few VP's! Considering the VP's attributes; timing, DGPS and carrier phase abilities, it maybe worth getting another VP. I'll have to give Art a call.

    Doug

      ----- Original Message -----
      From: Kirby, Brian
      To: TAPR Special Interest Group
      Sent: Wednesday, May 24, 2000 4:43 AM
      Subject: [tacgps] Re: Supplier for Motorola UT+

      I know Synergy also has some refurbed Oncore VPs.

> ----------
> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, May 23, 2000 8:03 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
> Bob, TAPR has about 8 UT+ in stock (they had about 8 unsold at Dayton).
>
> Doug
>
> ----- Original Message -----
> From: "Bob Smith" <bobsmith5@home.com>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Tuesday, May 23, 2000 2:50 PM
> Subject: [tacgps] Supplier for Motorola UT+
>
>
> >
> > My interest is in precision timing, not so much positioning.
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> > With the M12 falling out of favor for timing applications, I
> > am wondering about sources of supply for the Moto UT+ which
> > seems to be the leader of the pack in the post-SA era (and
> > probably was pre-SA).
> >
> > Bob Smith
> >
> >
> > --
> >
> > --------- Avoid computer viruses -- Practice safe hex
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

96. [tacgps] Re: Supplier for Motorola UT+

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 24 May 2000 11:25:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85851-2000.05.24-11.29.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gina Aspeytia at Synergy said (SPECZ is part of the part number) ; All of
the VP ONCORE parts are new, from the factory and have never been sold.
Motorola changed an oscillator part on these VPs at the factory which did
not meet specifications. The SPECZ in the middle of the part number is to
differentiate these parts with new oscillators from other VP units for
warranty purposes. We (Synergy) warranty these parts for 1 year but repairs
can only be made to the extent that parts are available to make repair.

> ----------
> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 11:05 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
> Hum, the old oscillator was the good part about the VP! Is the new
> oscillator an improvement or just a replacement?

>
> Doug
>
>   ----- Original Message -----
>   From: Kirby, Brian
>   To: TAPR Special Interest Group
>   Sent: Wednesday, May 24, 2000 8:59 AM
>   Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
>   I ordered one yesterday - $232. They have put a new oscillator in
> them.
>
>   ----------
>   From: Doug McKinney[SMTP:Design@mt.to]
>   Reply To: TAPR Special Interest Group
>   Sent: Wednesday, May 24, 2000 10:55 AM
>   To: TAPR Special Interest Group
>   Subject: [tacgps] Re: Supplier for Motorola UT+
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>   I heard that they had gotten a hold of a few VP's!
> Considering the VP's attributes; timing, DGPS and carrier phase abilities,
> it maybe worth getting another VP. I'll have to give Art a call.
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>   Doug
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>   ----- Original Message -----
>   From: Kirby, Brian
>   To: TAPR Special Interest Group
>   Sent: Wednesday, May 24, 2000 4:43 AM
>   Subject: [tacgps] Re: Supplier for Motorola UT+
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>   I know Synergy also has some refurbed Oncore VPs.
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>   ----------
>   From: Doug McKinney[SMTP:Design@mt.to]
>   Reply To: TAPR Special Interest Group
>   Sent: Tuesday, May 23, 2000 8:03 PM
>   To: TAPR Special Interest Group
>   Subject: [tacgps] Re: Supplier for Motorola UT+
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>
>   Bob, TAPR has about 8 UT+ in stock (they had
> about 8 unsold at Dayton).
>
>   Doug
>
>   ----- Original Message -----
>   From: "Bob Smith" <bobsmith5@home.com>
>   To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
>   Sent: Tuesday, May 23, 2000 2:50 PM
>   Subject: [tacgps] Supplier for Motorola UT+
>
>
>   >
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>   > With the M12 falling out of favor for timing applications,
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>
>
>

97. [tacgps] Re: Supplier for Motorola UT+

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 24 May 2000 11:29:17 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-85852-2000.05.24-11.32.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Also, the part number is B81SPECZ16 a version of the B8121Z1116. Same
receiver with version 10.0 firmware.

> ----------
> From: Kirby, Brian[SMTP:Brian.Kirby@MSFC.NASA.GOV]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 11:25 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
> Gina Aspeytia at Synergy said (SPECZ is part of the part number) ; All of
> the VP ONCORE parts are new, from the factory and have never been sold.
> Motorola changed an oscillator part on these VPs at the factory which did
> not meet specifications. The SPECZ in the middle of the part number is to
> differentiate these parts with new oscillators from other VP units for
> warranty purposes. We (Synergy) warranty these parts for 1 year but
> repairs can only be made to the extent that parts are available to make
> repair.
>
>
> ----------
> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 11:05 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
>
> Hum, the old oscillator was the good part about the VP! Is the new
> oscillator an improvement or just a replacement?
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> Doug
>
> ----- Original Message -----
> From: Kirby, Brian
> To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 8:59 AM
> Subject: [tacgps] Re: Supplier for Motorola UT+
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>
> I ordered one yesterday - $232. They have put a new
> oscillator in them.
>
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> From: Doug McKinney[SMTP:Design@mt.to]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, May 24, 2000 10:55 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Supplier for Motorola UT+
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> I heard that they had gotten a hold of a few VP's!
> Considering the VP's attributes; timing, DGPS and carrier phase abilities,
> it maybe worth getting another VP. I'll have to give Art a call.
>
>
>   Doug
>
>
>   ----- Original Message -----
>   From: Kirby, Brian
>   To: TAPR Special Interest Group
>   Sent: Wednesday, May 24, 2000 4:43 AM
>   Subject: [tacgps] Re: Supplier for Motorola UT+
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>
>   I know Synergy also has some refurbed Oncore
> VPs.
>
>   ----------
>   From: Doug McKinney[SMTP:Design@mt.to]
>   Reply To: TAPR Special Interest Group
>   Sent: Tuesday, May 23, 2000 8:03 PM
>   To: TAPR Special Interest Group
>   Subject: [tacgps] Re: Supplier for Motorola UT+
>
>
>   Bob, TAPR has about 8 UT+ in stock
> (they had about 8 unsold at Dayton).
>
>   Doug
>
>   ----- Original Message -----
>   From: "Bob Smith" <bobsmith5@home.com>
>   To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
>   Sent: Tuesday, May 23, 2000 2:50 PM
>   Subject: [tacgps] Supplier for Motorola UT+
>
>
>   >
>   > My interest is in precision timing, not so much
> positioning.
>   >
>   > With the M12 falling out of favor for timing applications,
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>   > am wondering about sources of supply for the Moto UT+
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>   > Bob Smith
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>   > --
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> leave-tacgps-6754G@lists.tapr.org

>
>
>
>

98. [tacgps] M12 Eval Kit Issues

From: "Randy Warner" <randy@synergy-gps.com>
Date: Thu, 25 May 2000 17:58:53
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86420-2000.05.25-18.01.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

OK, I have finally joined the list to see what you guys have been saying
about me...

First Issue: Since I was apprised by Tom and Rick about the inverted 1PPS
issue, we have modified the Eval Board assembly to correct the inversion.
Physically, the boards are being modified almost exactly the way Rick
mentioned in his previous post, except that The entire mod is being made on
the top side of the board (without drilling a hole as Rick did.) Modified
boards are identified as Assembly Revision "A". You can also see the 1"
piece of 30 ga kynar wire on the topside of the board.
The second group of 400 Eval boards (which started showing up from our
assemby house this afternoon) are all being reworked to the Rev A
configuration. They should start leaving early next week.

I apologize for all the fuss this caused. Since the Eval board was never
intended for precision timing, I just never worried about the polarity...

Second Issue: I saw another post asking if we would be replacing the old
boards. Well, no. However, I will be happy to forward the rework
instructions to anyone who asks. It's a 2 minute fix for anyone half way
handy with a soldering iron. If you are uncomfortable modifying your board,
just email me to let me know, send the board back, and I'll fix it on my
dime...

Third Issue: Rick also mentioned that he did not know if the M12 on the
Adapter board suffers from the same problem. The answer is NO. All of the
signal polarities coming from the adapter board are identical to the older
Oncores (VP, UT, GT) that the adapter replaces.

Randy Warner
Senior Applications Engineer
Synergy Systems, LLC

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

99. [tacgps] Allan variance??

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 26 May 2000 09:04:54 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86572-2000.05.26-08.07.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I see the term Allan variance come up more and more
frequently in conjuction with oscillator performance.

Can anyone point me to an application note or a tutorial
that describes this characterization and perhaps help me
understand its significance.

        Thank you, Bob Smith

--

--------- Avoid computer viruses -- Practice safe hex
----
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

100. [tacgps] Re: Allan variance??

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Fri, 26 May 2000 08:21:26 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86592-2000.05.26-10.23.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> I see the term Allan variance come up more and more
> frequently in conjuction with oscillator performance.
>
> Can anyone point me to an application note or a tutorial
> that describes this characterization and perhaps help me
> understand its significance.

See http://tycho.usno.navy.mil/mclocks2.html

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

101. [tacgps] Re: Allan variance??

From: Gordon Uber <gordon@ubr.com>
Date: Fri, 26 May 2000 08:31:29 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86594-2000.05.26-10.34.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For a description and reference list by David Allan himself see
<http://www.allanstime.com/AllanVariance/>

Gordon

At 09:04 AM 5/26/00 -0400, Bob Smith wrote:

>I see the term Allan variance come up more and more
>frequently in conjuction with oscillator performance.
>
>Can anyone point me to an application note or a tutorial
>that describes this characterization and perhaps help me
>understand its significance.
>
>   Thank you, Bob Smith

Gordon Uber   gordon@ubr.com San Diego, California USA
Webmaster: Clocks and Time: http://www.ubr.com/clocks

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102. [tacgps] Re: Allan variance??

From: Jim Johnson <jim_johnson@agilent.com>
Date: Fri, 26 May 2000 09:19:44 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86608-2000.05.26-11.23.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Bob,

   Hewlett-Packard (now the Agilent side) has a recent application note
that gives a brief overview of the two-sample variance (Allan variance).
The number of that app note is 1289 and it is titled "The Science of
Timekeeping". The author first listed in the credits is Dave Allan
himself. I have other material, depending upon how deeply you would
like to get into the topic, but it gets heavy into the math rather quickly.

   In one sentence, I would say the Allan variance is a statistical measure
of the time domain stability of an oscillator as a function of averaging
time. As a means of evaluating any particular oscillator, for a given
averaging time (say 1, 10, or 100 seconds), the lower the Allan variance
(often expressed as Allan deviation or the square root of Allan variance)
the more stable is the oscillator.

I have a call into the Agilent division that produced the app note so
when (if) somebody calls me back, I'll let you know if the note is still
available and how to get it.

73,
Jim W6SC

Bob Smith wrote:
>
> I see the term Allan variance come up more and more
> frequently in conjuction with oscillator performance.
>
> Can anyone point me to an application note or a tutorial
> that describes this characterization and perhaps help me
> understand its significance.
>
>   Thank you, Bob Smith
>

--

  Jim Johnson
  jim_johnson@agilent.com
  Agilent Laboratories
  "Innovating the HP Way"
  www.labs.agilent.com

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103. [tacgps] Re: Allan variance??

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Fri, 26 May 2000 11:24:44 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86611-2000.05.26-11.27.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim & Bob- Here's the link to the .pdf version of this application note:

http://www.tm.agilent.com/tmo/Notes/English/5965-7984E.html

(You can download the .pdf file from this page.)

73's

Gary N8DMT

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email[anti-spam_remove_brackets].mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Jim Johnson [mailto:jim_johnson@agilent.com]
Sent: Friday, May 26, 2000 11:20 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: Allan variance??

Hi Bob,

   Hewlett-Packard (now the Agilent side) has a recent application note
that gives a brief overview of the two-sample variance (Allan variance).
The number of that app note is 1289 and it is titled "The Science of
Timekeeping". The author first listed in the credits is Dave Allan
himself. I have other material, depending upon how deeply you would
like to get into the topic, but it gets heavy into the math rather quickly.

   In one sentence, I would say the Allan variance is a statistical measure
of the time domain stability of an oscillator as a function of averaging
time. As a means of evaluating any particular oscillator, for a given
averaging time (say 1, 10, or 100 seconds), the lower the Allan variance
(often expressed as Allan deviation or the square root of Allan variance)

the more stable is the oscillator.

   I have a call into the Agilent division that produced the app note so
when (if) somebody calls me back, I'll let you know if the note is still
available and how to get it.

73,
Jim W6SC

Bob Smith wrote:
>
> I see the term Allan variance come up more and more
> frequently in conjuction with oscillator performance.
>
> Can anyone point me to an application note or a tutorial
> that describes this characterization and perhaps help me
> understand its significance.
>
>   Thank you, Bob Smith
>

--

  Jim Johnson
  jim_johnson@agilent.com
  Agilent Laboratories
  "Innovating the HP Way"
  www.labs.agilent.com

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---
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104. [tacgps] Re: Allan variance??

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Fri, 26 May 2000 12:26:29 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86613-2000.05.26-11.28.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HP's "AN 1289: The Science of Timekeeping" is available at
http://www.tm.agilent.com/tmo/Notes/English/5965-7984E.html

Rick
W2GPS (ex WB2TNL)

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Jim Johnson
Sent: Friday, May 26, 2000 12:20 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: Allan variance??

Hi Bob,

   Hewlett-Packard (now the Agilent side) has a recent application note
that gives a brief overview of the two-sample variance (Allan variance).
The number of that app note is 1289 and it is titled "The Science of
Timekeeping". The author first listed in the credits is Dave Allan
himself. I have other material, depending upon how deeply you would
like to get into the topic, but it gets heavy into the math rather quickly.

   In one sentence, I would say the Allan variance is a statistical measure
of the time domain stability of an oscillator as a function of averaging
time. As a means of evaluating any particular oscillator, for a given
averaging time (say 1, 10, or 100 seconds), the lower the Allan variance
(often expressed as Allan deviation or the square root of Allan variance)
the more stable is the oscillator.

   I have a call into the Agilent division that produced the app note so
when (if) somebody calls me back, I'll let you know if the note is still
available and how to get it.

73,
Jim W6SC

Bob Smith wrote:
>
> I see the term Allan variance come up more and more
> frequently in conjuction with oscillator performance.
>
> Can anyone point me to an application note or a tutorial
> that describes this characterization and perhaps help me
> understand its significance.
>
>   Thank you, Bob Smith
>

--

  Jim Johnson
  jim_johnson@agilent.com
  Agilent Laboratories
  "Innovating the HP Way"
  www.labs.agilent.com

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---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

105. [tacgps] Re: Allan variance??

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sat, 27 May 2000 01:16:08 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-86712-2000.05.26-20.18.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob Smithasked:
>
> I see the term Allan variance come up more and more
> frequently in conjuction with oscillator performance.
>
> Can anyone point me to an application note or a tutorial
> that describes this characterization and perhaps help me
> understand its significance.
>
>   Thank you, Bob Smith

Several people gave good answers. The HP #1289 Application is
one of the bibles. In addition to the sources listed, it is on
my FTP site at
   ftp://tac.gsfc.nasa.gov/pub/hpan1289.pdf

In addition, you will find the HP Application Note on GPS timing
at
   ftp://tac.gsfc.nasa.gov/pub/hpac1272.pdf

If you want to see a plot showing typical Allan Variances for a
number of different frequency standards, see
   ftp://tac.gsfc.nasa.gov/pub/avar.pdf

Basically the Allan Variance is a measure of the predictability
of a clock or frequency standard. Let's say that you have a
wrist watch that gains 10 +/- 1 seconds per day. For simplicity,
I'll say that there are 10e5 seconds/day (actually 86400). The
ACCURACY of your clock is the about 1 part in 10e4, but because
you know the rate error, you can predict the reading tomorrow
after correcting for the rate to a level of 1 part in 10e5.

Now let's say that you repeat the at 10 day intervals, and find
that you can predict the time reading to 5 seconds. You now
have an uncertainty at 10 days of 5 parts in 10e6. These two
numbers at (10e5 and 10e6 seconds) are two points on the Allan
Variance.

In HPAN 1289 you will read some interesting measurements of
this type used to characterize the performance of John Harrison's
clocks built in the mid 1700's.

Hope this helped -- 73, Tom

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106. [tacgps] M12 and DGPS

From: Kenneth Lerman <lerman@lerman.nai.net>
Date: Tue, 30 May 2000 09:46:17 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87393-2000.05.30-09.24.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I just received my M12 kit from Synergy and was pleased to discover
that it has version 1.3 firmware which seems to support Motorola
binary DGPS generation.

So, the question is: does anyone have some (preferably) C code to
convert Motorola binary format to RTCM (do I have the letters right?)
format? Would you be willing to share it with me?

Regards,

Ken

--
Kenneth Lerman   Kenneth.Lerman@lerman.nai.net
Systems Essentials Limited   Fax: (203)426-9138
55 Main Street   Voice: (203)426-4430
Newtown, CT 06470   http://w3.nai.net/~lerman
PGP fingerprint = B1 66 29 FB CB 8C 6A 24 E1 DF B4 63 2C D6 5D AD

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107. [tacgps] Re: M12 and DGPS

From: Jim Korenz <n8pxw@yahoo.com>
Date: Tue, 30 May 2000 10:22:37 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87424-2000.05.30-12.25.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

--- Kenneth Lerman <lerman@lerman.nai.net> wrote:
>
> I just received my M12 kit from Synergy and was
> pleased to discover
> that it has version 1.3 firmware which seems to
> support Motorola
> binary DGPS generation.
>
> So, the question is: does anyone have some
> (preferably) C code to
> convert Motorola binary format to RTCM (do I have
> the letters right?)
> format? Would you be willing to share it with me?
>
> Regards,
>
> Ken
>
> --
> Kenneth Lerman
> Kenneth.Lerman@lerman.nai.net
> Systems Essentials Limited
> Fax: (203)426-9138
> 55 Main Street
> Voice: (203)426-4430
> Newtown, CT 06470
> http://w3.nai.net/~lerman
> PGP fingerprint = B1 66 29 FB CB 8C 6A 24 E1 DF B4
> 63 2C D6 5D AD
>
> ---

> You are currently subscribed to tacgps as:
> n8pxw@yahoo.com
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>

Hi Ken,
    I have a program, MOT2RTCM, that is written in "C"
and supports the 6 and 8 channel Motorola VP units. If
the M12 uses the same binary message types, it should
work. The program has the "room" for 12 channel
corrections. Steve Bible loaded the program and its
distribution files on the TAPR website. His
announcement follows this note. I have not received my
M12 yet, so I can't say for sure if it works. Be sure
and let me know if you get all 12 channels working. I
have included the source and executables for DOS, plus
sample input and output data, and some programs to aid
in debugging. Have fun !!!
     Jim Korenz   N8PXW

On 4/24/00 10:03 PM Steven R. Bible (srbible@gate.net)
wrote:
>Hello Jim and Steve,>>I've uploaded motrtcm.txt and
motrtcm.zip to>
> ftp://www.tapr.org/gps/DGPS/N8PXW>
>I've created a DGPS directory within the GPS
directory. I think that this
>is a good place to put it.>
>Jim, thanks a million for your contribution. Please
make an announcement to
>TACGPS and other lists you desire about the program
and the location.>
>Let me know what I can do to help you in the
future.>>73, Steve, N7HPR>
Steve K4HG

_____
Do You Yahoo!?
Kick off your party with Yahoo! Invites.
http://invites.yahoo.com/

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108. [tacgps] Re: M12 and DGPS

From: Kenneth Lerman <lerman@lerman.nai.net>
Date: Tue, 30 May 2000 13:12:51 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87457-2000.05.30-12.50.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Tue, May 30, 2000 at 10:22:37AM -0700, Jim Korenz wrote:
>
...
>
> Hi Ken,
>   I have a program, MOT2RTCM, that is written in "C"
> and supports the 6 and 8 channel Motorola VP units. If
> the M12 uses the same binary message types, it should
> work. The program has the "room" for 12 channel
> corrections. Steve Bible loaded the program and its
> distribution files on the TAPR website. His
> announcement follows this note. I have not received my
> M12 yet, so I can't say for sure if it works. Be sure
> and let me know if you get all 12 channels working. I
> have included the source and executables for DOS, plus
> sample input and output data, and some programs to aid
> in debugging. Have fun !!!
>   Jim Korenz   N8PXW
>
> On 4/24/00 10:03 PM Steven R. Bible (srbible@gate.net)
> wrote:
> >Hello Jim and Steve,>>I've uploaded motrtcm.txt and
> motrtcm.zip to>
> > ftp://www.tapr.org/gps/DGPS/N8PXW>
> >I've created a DGPS directory within the GPS
> directory. I think that this

> >is a good place to put it.>
> >Jim, thanks a million for your contribution. Please
> make an announcement to
> >TACGPS and other lists you desire about the program
> and the location.>
> >Let me know what I can do to help you in the
> future.>>73, Steve, N7HPR>
> Steve K4HG

Thank you, both.

It is my intention to try building this on Linux. I'll let you know
how I make out, and send you the source when I am done.

Ken

--
Kenneth Lerman   Kenneth.Lerman@lerman.nai.net
Systems Essentials Limited   Fax: (203)426-9138
55 Main Street   Voice: (203)426-4430
Newtown, CT 06470   http://w3.nai.net/~lerman
PGP fingerprint = B1 66 29 FB CB 8C 6A 24 E1 DF B4 63 2C D6 5D AD

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109. [tacgps] Re: M12 and DGPS

From: info@synergy-gps.com
Date: Tue, 30 May 2000 11:32:37 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87461-2000.05.30-13.35.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim,

The M12 does in fact develop the same differential correction
message as the old VP (the @@Bh message.) I have been using
an M12 with one of Steve's RTCM chips since the v1.3 firmware
came out. The only difficulty you might experience is that the M12
has a different command set for getting it into differential output
mode. If you have any embedded code to get it set up you might
have to tweak it a little.

Randy Warner
Synergy Systems

-------------------- Reply Separator ------------

> Hi Ken,
>   I have a program, MOT2RTCM, that is written in "C"
> and supports the 6 and 8 channel Motorola VP units. If
> the M12 uses the same binary message types, it should
> work. The program has the "room" for 12 channel
> corrections. Steve Bible loaded the program and its
> distribution files on the TAPR website. His
> announcement follows this note. I have not received my
> M12 yet, so I can't say for sure if it works. Be sure
> and let me know if you get all 12 channels working. I
> have included the source and executables for DOS, plus
> sample input and output data, and some programs to aid
> in debugging. Have fun !!!
>   Jim Korenz   N8PXW
>
> On 4/24/00 10:03 PM Steven R. Bible (srbible@gate.net)
> wrote:
> >Hello Jim and Steve,>>I've uploaded motrtcm.txt and
> motrtcm.zip to>
> > ftp://www.tapr.org/gps/DGPS/N8PXW>
> >I've created a DGPS directory within the GPS
> directory. I think that this
> >is a good place to put it.>
> >Jim, thanks a million for your contribution. Please
> make an announcement to
> >TACGPS and other lists you desire about the program
> and the location.>
> >Let me know what I can do to help you in the
> future.>>73, Steve, N7HPR>
> Steve K4HG

```
>
> ______________________________________________________
> Do You Yahoo!?
> Kick off your party with Yahoo! Invites.
> http://invites.yahoo.com/
>
> ---
> You are currently subscribed to tacgps as: randy@synergy-gps.com
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>


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```

110. [tacgps] Brief address change test

From: "Frank R. Leslie" <fleslie@brevard.net>
Date: Tue, 30 May 2000 15:43:54 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87477-2000.05.30-14.47.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
address change posting test

Frank


-
=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-|
|  Frank R. Leslie          |  Pers. email: mailto:fleslie@bigfoot.com |
|  1017 Glenham Drive, NE   |  Prof. email:  mailto:f.leslie@ieee.org  |
|  Palm Bay FL 32905-4855   |  Home: (321) 768-6629 | KD4EYQ  | 000126 |
|  Work: retired |  Fax: email only please | 28-01.3130N / 80-35.6136W |
|                                 ---                                  |
|    Home Page:  http://www.geocities.com/RainForest/2210              |
|                 (Environment and nature)                             |
|    Home Page:  http://www.geocities.com/Yosemite/1270                |
|                 (Outings, Hiking & Wind River trip advice)           |
|    Home Page:  http://www.geocities.com/WallStreet/3298              |
|                 (Finance/Mutual Funds Allocation Suggestions)        |
|    Home Page:  http://www.geocities.com/Yosemite/Falls/8207          |
|                 (Trails and Greenways in Brevard County, Florida)    |
|                                 ---                                  |
|    "You cannot step twice in the same river."  -- Heraclitus         |
|              c. 535 - c.475 B.C. Greek Philosopher                   |
|=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-|


---
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```

111. [tacgps] Oncore UT+ Battery

From: "Scott O'Connell" <scotto@ipars.sds.com>
Date: Tue, 30 May 2000 12:54:23 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87479-2000.05.30-14.56.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
I received my Oncore UT+ from TAPR on Friday.  The TAC-2 is on backorder
and not expected for three weeks.

I was wondering if I should apply +5 while I'm waiting or if it's okay to
just let this sit in the static bag until the rest of the project is here?

Thanks in advance!

--

Scott O'Connell
Spectrum Data Services
scotto@sds.com
```

--

Visit the Berlin Fan Page at www.berlinpage.com

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112. [tacgps] RE: Oncore UT+ Battery

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Tue, 30 May 2000 15:16:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-87481-2000.05.30-15.18.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Scott- I'd just leave it in the bag... Even with the battery, the board
will fire right up (and start gathering an almanac if it needs one) when you
start using it. I have left boards in static bags for several months
without any adverse effect.

If you're planning on using TAC32 software in your station, the software
will initialize the receiver to get you off to a good start. I'd plan on
allowing 20 minutes or so to get a fresh almanac loaded, 24 hours for a good
position determination (a great one without SA now!), and then you're ready
to go!

Have fun with your TAC2/UT+ station. Be sure to checkout the board's
wiring/connections before inserting the receiver into the TAC2. (You don't
want to 'let the smoke out' too soon! :o)

73's

Gary N8DMT

Gary Mastenbrook, Product Visioneering, Motorola, Inc.
50 E. Commerce Drive, Schaumburg, IL 60173
Email: g13216@email[anti-spam_remove_brackets].mot.com
Work Home Page: http://www.mot.com/telematics
Personal Home Page: http://www.qsl.net/n8dmt

-----Original Message-----
From: Scott O'Connell [mailto:scotto@ipars.sds.com]
Sent: Tuesday, May 30, 2000 2:54 PM
To: TAPR Special Interest Group
Subject: [tacgps] Oncore UT+ Battery

I received my Oncore UT+ from TAPR on Friday. The TAC-2 is on backorder
and not expected for three weeks.

I was wondering if I should apply +5 while I'm waiting or if it's okay to
just let this sit in the static bag until the rest of the project is here?

Thanks in advance!

--

Scott O'Connell
Spectrum Data Services
scotto@sds.com

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June 2000

Original source file: tacgps.0006
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0006

1. [tacgps] Case recommendation?

From: "Scott O'Connell" <scotto@sds.com>
Date: Fri, 2 Jun 2000 17:05:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-88167-2000.06.02-20.08.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Can anyone make a case recommendation for the TAC-2 with Oncore UT+?
Perhaps a Mouser part number? Thanks.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: Case recommendation?

From: "JOHN DEGOOD" <jdegood@sarnoff.com>
Date: Mon, 05 Jun 2000 10:33:27 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-88816-2000.06.05-09.36.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If you intend to use it with a PC, it will fit nicely in a scrap 5.25"
hard disk tray. Connect the PPM LED signal to the hard drive activity
LED on the front of the tray, obtain power from one of the drive power
connectors, and connect the serial and PPM signals to the appropriate
motherboard headers. Makes a very neat installation, with only the
antenna cable exiting the case.

73,

John NU3E

Scott O'Connell wrote:
>
> Can anyone make a case recommendation for the TAC-2 with Oncore UT+?
> Perhaps a Mouser part number? Thanks.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] VPGUIB Board

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Fri, 9 Jun 2000 15:13:11
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89827-2000.06.09-15.16.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Help....

Got a question about the TAC "add in" part of the board, specifically J3
and J4.

If I understand it, J3 is added from Pin 2 of the 74AC04N to pin 10 of the
MAX232 chip. J4 runs from the raw 1 PPS out on the right side of R3 to pin
1 of the 74AC04N. Then take 1 PPS from pin 7 of MAX232 out to DB-9 pin 1
for RS232 interface. Correct ?

Also, the Low Z output, on the bottom of the board, appears to need a strap
from the right side of RP1 to pins 2, 3, 4, or 5 of RP1. Which would be a
Positive going (non inverted pulse) connection ? (Plan to feed to a BNC
output).

Thanks - Brian - KD4FMN

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4. [tacgps] Totally Accurate Clock for Netware

From: "W. D." <xyz@netins.net>
Date: Sat, 10 Jun 2000 00:13:34 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89924-2000.06.10-00.16.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi,

I am putting together a home network using Netware 4.11. I would like
to have the clock on the server fairly accurate, but only have a dialup
connection to the Internet.

Does anyone have some suggestions on how I could do this, possibly
with this TAC?

Thanks,

W. D.

Start Here to Find It Fast!© -> http://US-WebMasters.com/start.htm

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: Totally Accurate Clock for Netware

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 10 Jun 2000 11:41:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89979-2000.06.10-10.44.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"W. D." wrote:
>
> Hi,
>
> I am putting together a home network using Netware 4.11. I would like
> to have the clock on the server fairly accurate, but only have a dialup
> connection to the Internet.
>
> Does anyone have some suggestions on how I could do this, possibly
> with this TAC?

Phil Karn's(KA9Q) NOS (Network Operating System, now
appearing as JNOS and other derivatives) supported SNTP
(Simple Network Time Protocol, I think) servers and
clients. If this is for personal use (i.e. non-commercial)
I'm sure he wouldn't mind if you lifted a bit of code. Also
check out a freeware program floating around the net called
4DTime by "Fourth Dimension". It supports NTP, I keep my PC
clock up to date by connecting to the USNO every day. Its
utterly amazing how the PC clock staggers around with no
rhyme or reason.

        Bob Smith

>
> Thanks,
>
> W. D.
>
> Start Here to Find It Fast!© -> http://US-WebMasters.com/start.htm
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex
----
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org

To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] HP 10544A Oscillator pin-out needed

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Sat, 10 Jun 2000 11:44:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89982-2000.06.10-10.47.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and or schematic. No, it is not the same as for a HP 10811A. Or if you have the schematic of a HP 5328A or other frequency counter that used the HP 10544A. I know the HP 10811A can substitute for the HP 10544A but I am not sure about the other way around. The oscillator will become part of my TAC system.

Thanks,

John WA4WDL

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7. [tacgps] Re: VPGUIB Board

From: "Doug McKinney" <Design@mt.to>
Date: Sat, 10 Jun 2000 08:43:15 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89983-2000.06.10-10.47.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

----- Original Message -----
From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Friday, June 09, 2000 3:13 PM
Subject: [tacgps] VPGUIB Board

> Help....
>
> Got a question about the TAC "add in" part of the board, specifically J3
> and J4.
>
> If I understand it, J3 is added from Pin 2 of the 74AC04N to pin 10 of the
> MAX232 chip. J4 runs from the raw 1 PPS out on the right side of R3 to
pin
> 1 of the 74AC04N. Then take 1 PPS from pin 7 of MAX232 out to DB-9 pin 1
> for RS232 interface. Correct ?

Correct.

>
> Also, the Low Z output, on the bottom of the board, appears to need a
strap
> from the right side of RP1 to pins 2, 3, 4, or 5 of RP1. Which would be a
> Positive going (non inverted pulse) connection ? (Plan to feed to a BNC
> output).

To be clear about what RP1 is; RP1 is 5 - 51 ohm resistors bused together (at pin 1) of which only 4 are used. 4 hex inverters are paralleled to provide low-z. Each output is buffered with a 51 ohm resistor and the parallel output is on pin 1 of RP1, pin 6 is an extra 51 ohm resistor, which is not used. I made this statement becuase I don't know what you meant about "need a strap".

>
> Thanks - Brian - KD4FMN
>
> ---
> You are currently subscribed to tacgps as: KC3RL@MCKTECH.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

8. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 10 Jun 2000 12:02:45 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89985-2000.06.10-11.05.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Be careful here. There is a HP10811A and a B model. The
older A, I think, used a pcb style edge connector. The B
uses feedthroughs and coax connectors.

        Bob Smith.

John Franke wrote:
>
> Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
> or schematic. No, it is not the same as for a HP 10811A. Or if you have
> the schematic of a HP 5328A or other frequency counter that used the HP
> 10544A. I know the HP 10811A can substitute for the HP 10544A but I am not
> sure about the other way around. The oscillator will become part of my TAC
> system.
>
> Thanks,
>
> John WA4WDL
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex
----
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Sat, 10 Jun 2000 12:14:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-89987-2000.06.10-11.17.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Correct, but as you point out the differences are obvious. The A uses a
fifteen pin edge connector for all connections whereas the B uses
feedthroughs for power and oven circuits and SMB connectors for RF and EFC.

John

>Be careful here. There is a HP10811A and a B model. The
>older A, I think, used a pcb style edge connector. The B
>uses feedthroughs and coax connectors.
>
>   Bob Smith.
>
>John Franke wrote:
>>
>> Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
>> or schematic. No, it is not the same as for a HP 10811A. Or if you have
>> the schematic of a HP 5328A or other frequency counter that used the HP
>> 10544A. I know the HP 10811A can substitute for the HP 10544A but I am not
>> sure about the other way around. The oscillator will become part of my TAC
>> system.
>>
>> Thanks,
>>
>> John WA4WDL
>>
>> ---

```
>> You are currently subscribed to tacgps as: bobsmith5@home.com
>> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>--
>
>---------  Avoid computer viruses  --  Practice safe hex
>-------------
> * * Specializing in small, cost effective embedded control
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>Robert L. (Bob) Smith                  Smith Machine Works, Inc.
>internet   bobsmith5@home.com          9900 Lumlay Road
>landline   804/745-1065                        Richmond, Virginia
>23236+1004
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org




---
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```

10. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Sat, 10 Jun 2000 11:02:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90013-2000.06.10-13.05.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

```
The 10811 is a plug compatible replacement for instruments
designed for a 10544. But the 10544 may not be not plug
compatible with an instrument designed for a 10811 (since
the 10544 requires extra power connections and is not
designed to drive a 50R load).

HP 10544 (AT cut)

pin 1  - 10 MHz RF out (1000 R)
pin 2  - ground
pin 3  - Osc/Amp power *
pin 4  - Osc/Amp/RF ground
pin 5  - EFC ground
pin 6  - EFC Input *
pin 7  - NC
pin 8  - Oven controller power *
pin 9  - Oven controller ground
pin 10 - NC
pin 11 - Oven monitor
pin 12 - NC
pin 13 - NC
pin 14 - Oven power *
pin 15 - Oven ground

* Notes
- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
- Oven controller power +10.6 to 11.7 VDC (5 mA)
- Oven power is +15 to 30 VDC (2.5 W)
- EFC control range is -5 to +5 VDC


HP 10811 (SC cut)

pin 1  - 10 MHz RF out (50 R)
pin 2  - ground
pin 3  - Osc supply *
pin 4  - ground
pin 5  - ground
pin 6  - EFC Input *
pin 7  - NC
pin 8  - NC
pin 9  - NC
pin 10 - NC
pin 11 - Oven monitor
pin 12 - NC
pin 13 - NC
pin 14 - Oven power *
```

pin 15 - Oven ground

* Notes
- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
- Oven supply +20 to 30 VDC (2 W)
- EFC control range is -5 to +5 VDC

/tvb

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11. [tacgps] RE: HP 10544A Oscillator pin-out needed

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sat, 10 Jun 2000 14:05:03 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90016-2000.06.10-13.08.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi John --

Here's pages 3 and 4

John

-----Original Message-----
From: bounce-tacgps-5605@lists.tapr.org
[mailto:bounce-tacgps-5605@lists.tapr.org]On Behalf Of John Franke
Sent: Saturday, June 10, 2000 11:44 AM
To: TAPR Special Interest Group
Subject: [tacgps] HP 10544A Oscillator pin-out needed

Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
or schematic. No, it is not the same as for a HP 10811A. Or if you have
the schematic of a HP 5328A or other frequency counter that used the HP
10544A. I know the HP 10811A can substitute for the HP 10544A but I am not
sure about the other way around. The oscillator will become part of my TAC
system.

Thanks,

John WA4WDL

You are currently subscribed to tacgps as: JPRINGLE@TAMPABAY.RR.COM
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[Attachment: HP10544A 3-4.tif; image/tiff; 372,449 bytes]

12. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: Glenn Little <glittle@awod.com>
Date: Sat, 10 Jun 2000 13:53:47 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90015-2000.06.10-13.07.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John

I have a book on the 5328A. From that manual I will list the pin
definitions for the 10544 Oscillator module.
1 10 MHz Out
2 Ground
3 OSC/AMP
4 Ground
5 Ground
6 EFC
7 NC
8 + Oven Control (not connected in 10811A/B)
9 Ground (not connected in 10811A/B)
10 NC
11 10K resistor to Oven Controller side of heater (I/F card shows NC) (oven
monitor in 10811A/B)
12 NC
13 NC
14 +25VDC (heater supply) (+20 to +30 VDC in 10811A/B)

15 Common (heater)

Pin 3 goes to 15 UF to ground and 10M Ohms to + Oven Control (+13 VDC)
(this is +11 to +13.5 VDC osc supply in the 10811A/B)
Pin 6 EFC (External Frequency Control) goes to the wiper of a 10K
pot. This lead is bypassed to ground with 0.01 UF. One side of the pot
goes to ground, the other to +13 VDC via 17.8K resistor.
Pin 8 goes to + 13 VDC regulated supply.
Pin 15 goes to pin labeled 3.5 V common on oscillator I/F connector. +3.5
VDC is used on te display board. I do not see the source of the + 3.5
VDC. On the display board 3.5 V common is refered to as ground. I would
consider this as ground.

Hope that this helps. I can photo copy a few pages from the 5328A manual
if you want. The oscillator only has a block diagram, no schematic.   It
appears that the two oscillators are very simular.

73
Glenn
WB4UIV

At 11:44 AM 6/10/00 -0400, you wrote:
>Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
>or schematic. No, it is not the same as for a HP 10811A. Or if you have
>the schematic of a HP 5328A or other frequency counter that used the HP
>10544A. I know the HP 10811A can substitute for the HP 10544A but I am not
>sure about the other way around. The oscillator will become part of my TAC
>system.
>
>Thanks,
>
>John WA4WDL
>
>
>
>---
>You are currently subscribed to tacgps as: GLITTLE@AWOD.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

----
Glenn Little   glittle@awod.com   QCWA LM 28417
Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] RE: HP 10544A Oscillator pin-out needed

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sat, 10 Jun 2000 14:25:32 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90019-2000.06.10-13.28.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi John --

Here is page 1 of the HP10544A spec sheet. The other message was Pages 3-4.
If you can't read the TIF files I can send a copy by snail mail.

John

-----Original Message-----
From: bounce-tacgps-5605@lists.tapr.org
[mailto:bounce-tacgps-5605@lists.tapr.org]On Behalf Of John Franke
Sent: Saturday, June 10, 2000 11:44 AM
To: TAPR Special Interest Group
Subject: [tacgps] HP 10544A Oscillator pin-out needed

Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
or schematic. No, it is not the same as for a HP 10811A. Or if you have
the schematic of a HP 5328A or other frequency counter that used the HP
10544A. I know the HP 10811A can substitute for the HP 10544A but I am not

sure about the other way around. The oscillator will become part of my TAC
system.

Thanks,

John WA4WDL

You are currently subscribed to tacgps as: JPRINGLE@TAMPABAY.RR.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
[Attachment: HP10544A-1.tif; image/tiff; 63,250 bytes]

14. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Sat, 10 Jun 2000 14:36:55 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90021-2000.06.10-13.39.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

THANKS!!

John WA4WDL

>The 10811 is a plug compatible replacement for instruments
>designed for a 10544. But the 10544 may not be not plug
>compatible with an instrument designed for a 10811 (since
>the 10544 requires extra power connections and is not
>designed to drive a 50R load).
>
>HP 10544 (AT cut)
>
>pin 1 - 10 MHz RF out (1000 R)
>pin 2 - ground
>pin 3 - Osc/Amp power *
>pin 4 - Osc/Amp/RF ground
>pin 5 - EFC ground
>pin 6 - EFC Input *
>pin 7 - NC
>pin 8 - Oven controller power *
>pin 9 - Oven controller ground
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
>- Oven controller power +10.6 to 11.7 VDC (5 mA)
>- Oven power is +15 to 30 VDC (2.5 W)
>- EFC control range is -5 to +5 VDC
>
>
>HP 10811 (SC cut)
>
>pin 1 - 10 MHz RF out (50 R)
>pin 2 - ground
>pin 3 - Osc supply *
>pin 4 - ground
>pin 5 - ground
>pin 6 - EFC Input *
>pin 7 - NC
>pin 8 - NC
>pin 9 - NC
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
>- Oven supply +20 to 30 VDC (2 W)
>- EFC control range is -5 to +5 VDC
>

>/tvb
>
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Sat, 10 Jun 2000 14:38:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90022-2000.06.10-13.41.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks!!

John WA4WDL

>John
>
>I have a book on the 5328A. From that manual I will list the pin
>definitions for the 10544 Oscillator module.
>1 10 MHz Out
>2 Ground
>3 OSC/AMP
>4 Ground
>5 Ground
>6 EFC
>7 NC
>8 + Oven Control (not connected in 10811A/B)
>9 Ground (not connected in 10811A/B)
>10 NC
>11 10K resistor to Oven Controller side of heater (I/F card shows NC) (oven
>monitor in 10811A/B)
>12 NC
>13 NC
>14 +25VDC (heater supply) (+20 to +30 VDC in 10811A/B)
>15 Common (heater)
>
>
>Pin 3 goes to 15 UF to ground and 10M Ohms to + Oven Control (+13 VDC)
>(this is +11 to +13.5 VDC osc supply in the 10811A/B)
>Pin 6 EFC (External Frequency Control) goes to the wiper of a 10K
>pot. This lead is bypassed to ground with 0.01 UF. One side of the pot
>goes to ground, the other to +13 VDC via 17.8K resistor.
>Pin 8 goes to + 13 VDC regulated supply.
>Pin 15 goes to pin labeled 3.5 V common on oscillator I/F connector. +3.5
>VDC is used on te display board. I do not see the source of the + 3.5
>VDC. On the display board 3.5 V common is refered to as ground. I would
>consider this as ground.
>
>Hope that this helps. I can photo copy a few pages from the 5328A manual
>if you want. The oscillator only has a block diagram, no schematic.   It
>appears that the two oscillators are very simular.
>
>73
>Glenn
>WB4UIV
>
>
>At 11:44 AM 6/10/00 -0400, you wrote:
>>Looking for pin-out of a HP 10544A precision 10 MHz crystal oscillator and
>>or schematic. No, it is not the same as for a HP 10811A. Or if you have
>>the schematic of a HP 5328A or other frequency counter that used the HP
>>10544A. I know the HP 10811A can substitute for the HP 10544A but I am not
>>sure about the other way around. The oscillator will become part of my TAC
>>system.
>>
>>Thanks,
>>
>>John WA4WDL
>>

>>
>>
>>---
>>You are currently subscribed to tacgps as: GLITTLE@AWOD.COM
>>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>---
>Glenn Little   glittle@awod.com   QCWA LM 28417
>Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
>QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR
>---
>
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: Totally Accurate Clock for Netware

From: Dan Hinz <dan.hinz@ieee.org>
Date: Sat, 10 Jun 2000 12:10:46 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90025-2000.06.10-14.14.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm not familiar with the intricacies of NetWare. I use Timelord

http://www.ossystems.co.uk/

they have both a server and client. I use it on a W95 / W98 network.
$10 shareware fee is very modest. The W95 machine has the TAC mounted
in it and is the TimeLord server. I set TAC to update time
automatically at 0.5sec discrepancy. The other machine, client, updates
at hourly intervals....

Dan
W6LSN

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: Totally Accurate Clock for Netware

From: "W. D." <xyz@netins.net>
Date: Sat, 10 Jun 2000 14:38:51 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90028-2000.06.10-14.41.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for your reply, Dan.

When you say that you have the TAC mounted in your W95 machine, is
is in a ISA slot? How many components are there? Who are the
vendors?

Thanks for your help!

At 12:10 6/10/2000 -0700, Dan Hinz, wrote:
>I'm not familiar with the intricacies of NetWare. I use Timelord
>
>http://www.ossystems.co.uk/
>
>they have both a server and client. I use it on a W95 / W98 network.
>$10 shareware fee is very modest. The W95 machine has the TAC mounted
>in it and is the TimeLord server. I set TAC to update time
>automatically at 0.5sec discrepancy. The other machine, client, updates
>at hourly intervals....
>
>Dan
>W6LSN
>
>

>---
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>

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---
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18. [tacgps] Re: Totally Accurate Clock for Netware

From: Dan Hinz <dan.hinz@ieee.org>
Date: Sat, 10 Jun 2000 13:10:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90034-2000.06.10-15.13.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

W.D.

I took an old 3.5" to 5.25" hard drive mounting adapter and beat the
snot out of it with a hammer while mounted in a vice. (Not a pretty
installation) What I did was to bend it to the shape of a tray with a
hole in the middle. I mounted the TAC card with Nylon screws to holes
that I drilled in the bottom of the "tray". If you look at the bottom
of my tray, from side to side you see:
metal of the bracket/tray, the card, the metal of the bracket/tray.

|___----___|

I drilled four holes in the front of the bracket.
I mounted 1 BNC to connect to the antenna.
2 BNC's for 1 PPS signals
1 LED to see the 1 PPS signal.

I purchased a header to header cable and connected the RS-232 from the
TAC directly to one of the serial ports on the computer. (the port
accessible from the outside of the case is now dead)

I modified a power supply adapter cable to allow me to connect directly
to the PC power supply.

For the antenna I took the antenna that I purchased at the same time as
the GPS (from TAPR) and cut the cable off. I saved about 10-12" piece
with the connector which attaches to the back of the BNC. I left about
a 18" pigtail on the antenna to which I added a BNC. The antenna sits
on top of my chimney cap and the BNC connects to the 9913 cable going to
the shack. All wrapped in coax seal, been installed over a year now.

Hope that helps.

Dan
W6LSN

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19. [tacgps] Re: file

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Sat, 10 Jun 2000 18:23:41 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90072-2000.06.10-20.26.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Please don't send everyone in the world an 85K file unless it is
really of value to everyone. In this case, on the one individual
needed it.

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20. [tacgps] Phase noise - Rb vs Xtal

From: Kohjin Yamada <kohjin@marina.prug.or.jp>
Date: Sun, 11 Jun 2000 12:18:31 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90082-2000.06.10-22.22.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have almost finished evaluation of Brooks's GPS disciplined both
rubidium (FRK-L) and Xtal (HP10811 in HP5345A) OSC.
A bunch of data has been taken from the controller and been analyzed
by DADiSP but it's still in survey for the best timing system, Rb or Xtal.

So far, it looks Rb stays in very good for timing purpose.
As my interest is to obtain a clear low noise reference rather than a precise
timing, I need some help.

I was told that Rb must be more noisier than Xtal.
Does anyone have any experience of comparison between GPS disciplined
Rb and Xtal OSC in their phase noise characteristic?
Can you tell how good, say -160dBc 1kHz offset etc etc?

Kohjin - JR1EDE

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21. [tacgps] Re: Totally Accurate Clock for Netware

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 11 Jun 2000 03:56:51 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90084-2000.06.10-23.00.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"W. D." wrote:
>
> Thanks for your reply, Dan.
>
> When you say that you have the TAC mounted in your W95 machine, is
> is in a ISA slot? How many components are there? Who are the
> vendors?

As Dan Hinz reported, using a TAC in a disk drive bay takes very little
work. When I designed the TAC-2 board, I intended it to be usable in a 5"
disk drive bay. You will find that the Molex power connector is compatible
with a disk drive connector by intention (and a lot of my testing has used
a junk PC power supply to power the TACs here). The 10-pin IDC RS232
connectors will plug in directly to many add-on RS232 boards (the kind that
mount a 9-pin connector on an unsued ISA/PCI slot bracket. All you need to
do is to figure out some way to get the coax cable into the machine. At one
point we (i.e. TAPR) was going to make a pre-configured drive bay TAC-2
mounting kit, but it never happened.

Regarding SNTP software: Take a look at Rick Hambly's (W2GPS, ex WB2TNL)
CNS website. For Windoze users (95/98/2000/NT),
TAC32+ works as a NTP time server. Rick's software can be found at
http://www.cnssys.com/tac32plus. Rick's web site also has info on how to
use LINUX with a TAC as a timeserver.

If you want to try synching your computer to a working TAC, you can reach
at TAC32+ timeserver running in Win2K at my tac.ggao.nasa.gov GPS R&D site,
and you can try Rick's TAC-based LINUX SNTP server at cnssys.com (a.k.a.
gpstime.com).

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] Re: Phase noise - Rb vs Xtal

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 11 Jun 2000 04:26:25 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-90088-2000.06.10-23.29.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Kohjin Yamada wrote:
>
> [snip]
> So far, it looks Rb stays in very good for timing purpose.
> As my interest is to obtain a clear low noise reference rather than a precise
> timing, I need some help.
>
> I was told that Rb must be more noisier than Xtal.
> Does anyone have any experience of comparison between GPS disciplined
> Rb and Xtal OSC in their phase noise characteristic?
> Can you tell how good, say -160dBc 1kHz offset etc etc?
>
> Kohjin - JR1EDE

Kohjin - a Rb standard consists of a crystal oscillator (like at 5 or 10
MHz) locked to the 6.8+ Rb transition. Since a Rb is a crystal oscillator
at short time scales, it will NEVER be more quiet than the crystal would be
if it were running "nude".
The short-term noise depends on how good is the crystal in the Rb.

The intrinsic linewidth of the 6.8 GHz Rb transitition is
several hundred Hertz. 6.8 GHz energy generated by the xtal is pumped into
an optical cell which contains heated Rb gas. A lamp generated by a plasma
discharge in Rb gas shines thru the optical+RF cell, and the light is
detected by a photocell.
When the microwave frequency coincides with the 6.8 GHz hyperfine
resonance, the intensity of the light drops by a small fraction of a
percent.

The xtal oscillator is FM modulated by a low frequency audio signal at a
frequency F. Then when the center frequency matches the Rb spectral line,
the photocell sees a peak (weak!) signal at a frequency 2F. When the xtal
is slightly off frequency, then a synchronous detector can measure the
phase at frequency F and adjust the center frequency. Because the signal is
very weak, this is a noisy detection process and the loop integration time
is many seconds to detect the F/2F signals.

Because the 6.8 GHz signal from the xtal needs to be FM modulated, in most
simple Rb oscillators this is done by FMing the xtal itself, meaning that
although the AVERAGE frequency is correct, there is a considerable amount
of FM noise at the frequency F which will be seen if you use the xtal at
microwave frequencies.

Some of the most modern Rb standards use a numerically controlled
oscillator in the 6.8 GHz generation circuit, and they can make the FM
signal without FM modulating the xtal itself. Other Rb standards use phase
modulation in their multiplier/synthesizer chain, so the xtal frequency is
not perturbed. But do not be surprised is you hear some audio FM (typically
in the 50-200 Hz range) when you use a Rb at microwaves!

As I have said many times, the best way to visualize the performance of any
of these standards is by looking at their Allan Variance. I have collected
sample, typical AVARs for a number of standards in the plot at

        ftp://tac.gsfc.nasa.gov/pub/avar.pdf

although I have not updated this plot since SA was turned off, and the GPS
curves are now too pessimistic.

To get a lot of insite into AVAR and frequency standards, I recommend you
read the HP Application note #1289, which is available many places,
including my FTP site at

        ftp://tac.gsfc.nasa.gov/pub/hpan1289.pdf

Hope this helped -- 73, Tom

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23. [tacgps] RE: Totally Accurate Clock for Netware

From: "Robert E. Martinson" <remartin@tiac.net>
Date: Sun, 11 Jun 2000 00:31:31 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90089-2000.06.10-23.34.39--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Hi all,

I maybe accused of being a traitor (I do have a TACGPS) but: I've found the
WWVB clock/receiver by Achron-Zeit (www.atomictime.com) works very well. It
connects to a PC via a serial cable and can set the PC's clock every x
minutes or only at boot. Small battery operated clock, works great!

I have no connection w/Achron-Zeit or AtomicTime.

73,
Bob
N1VQR@amsat.org

-----Original Message-----
From: bounce-tacgps-5665@lists.tapr.org
[mailto:bounce-tacgps-5665@lists.tapr.org]On Behalf Of W. D.
Sent: Saturday, June 10, 2000 1:14 AM
To: TAPR Special Interest Group
Subject: [tacgps] Totally Accurate Clock for Netware

Hi,

I am putting together a home network using Netware 4.11. I would like
to have the clock on the server fairly accurate, but only have a dialup
connection to the Internet.

Does anyone have some suggestions on how I could do this, possibly
with this TAC?

Thanks,

W. D.

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24. [tacgps] Re: Totally Accurate Clock for Netware

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 11 Jun 2000 14:08:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90221-2000.06.11-14.12.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

W.D. -

Specifically for NetWare 4.x , I am unaware of an NLM written to take a GPS
source (a.k.a TAC-2) and perform the clock synchronization. If you wish to
write the NLM, then you probably want to look at Tom Clark's original DOS
program, the NTP Unix/Linux source code for starting points and probbaly
talk to W2GPS.

A few years ago, many people were writing NLM --- but as NetWare interest
has decreased (Linux and Windows NT) ... I have found interest to be small.

G. Beat
w9gb

- Original Message -----
From: "W. D." <xyz@netins.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, June 10, 2000 12:13 AM
Subject: [tacgps] Totally Accurate Clock for Netware

Hi,

I am putting together a home network using Netware 4.11. I would like

to have the clock on the server fairly accurate, but only have a dialup
connection to the Internet.

Does anyone have some suggestions on how I could do this, possibly
with this TAC?

Thanks,

W. D.

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25. [tacgps] RE: WWVB Receiver Article in 73 Magazine?

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Sun, 11 Jun 2000 23:29:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90329-2000.06.12-01.32.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Cc: tacgps@lists.tapr.org, FYI(comments welcome):

Please delete if not relevant to current discussions on the list.

No, Bob, you're not slipping.

The requested information was mailed promptly. It was received
and has been studied in detail.

I have wanted to build a similar WWVB receiver for years. I
also build the Goral Oscillator, when I first saw the article
in Ham Radio Magazine. That should tell you how many years I have
thinking about this project.

I like your way of adding AGC to this oscillator! Very clever!

Unlike your TRF receiver approach, I was planning to use a
superheterodyne receiver, with an LO of either 62.5 KHz, or 50 KHz,
derived from the 10MHZ oscillator, by dividing by 160 or 200, and
appropriately filtered and amplified in the 2.5 KHz or 10 KHz IF
amplifier. This IF signal, including oscillator drift, would be
used as the reference input to a phase-locked loop.

The same frequency as the LO would further be divided by either
25 or 5, and this signal, again either 2.5 KHz or 10 KHz would be
used as the other input to the phase-locked loop.

While it may not be obvious that this would work, comparing two
signals both containing oscillator drift, it should work, due to
the fact that the two signals drift at different rates, based on
the division factors of the 10MHz oscillator signal.

What has stopped me on this project, is that I don't have any
experience designing phase-locked loops at these low frequencies.

I am also not sure that it is a good idea to phase-lock the oscillator
on such a low frequency. It would probably be better to derive a 10 MHZ
signal, somehow, from the 60KHz WWVB signal, and phase-lock the oscillator
directly on 10 MHz.

Please feel free to toss this idea around, and let me know if you have any
comments, suggestions and/or questions!

I have since acquired an HP 10811A 10 MHz ovenized oscillator, and I am now
leaning towards using a GPS receiver module to phase-lock this oscillator
to,
somewhat like Brooks Shera, W5OJM, describes in his article in the July,

1998
issue of QST Magazine.

WWVB may still be a very accurate time and frequency reference, but GPS is
now
probably better by at least a factor of 100.

So, many thanks for the copy of your 73 Magazine article. I appreciate the
work
you put in to the design of this WWVB receiver, and I appreciate the fact
that
you wanted to share your design with others.

Thanks again,

-- Flemming Larsen, KB6ADS

> -----Original Message-----
> From: Bob Roehrig [mailto:broehrig@admin.aurora.edu]
> Sent: Wednesday, June 07, 2000 06:39
> To: Flemming Larsen
> Subject: RE: WWVB Receiver Article in 73 Magazine?
>
>
> On Wed, 15 Mar 2000, Flemming Larsen wrote:
>
> > Thanks!
> >
> >   Flemming Larsen
> >   1442A Walnut Street #169
> >   Berkeley, CA 94709-1405
> >
>
> I am slipping - did I ever send you the info?
>
>
>   "Nostalgia is a thing of the past"
>   E-mail: broehrig@admin.aurora.edu or k9eui@arrl.net   73 de Bob, K9EUI
>   CIS: Data / Telecom   Aurora University, Aurora, IL
>   630-844-4898 Fax 630-844-4222
>   PLEASE PUT ALL REPLIES IN ASCII TEXT ONLY
>
>

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26. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: mdmiller@fastlane.net
Date: Mon, 12 Jun 2000 01:27:17 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90333-2000.06.12-01.37.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This discussion is very timely for me. This weekend at Hamcom I purchased a
HP 5328A with a 10811 inside. My 10811 is connected to another PC board
through an edge card connector, and that PC board is connected through
another edge card connector to a larger PC board. Does anyone have a
schematic for the PC board that the 10811 is mounted to? I want to
discipline the 10811 with the Brooks Shera's GPS-Controlled Frequency
Standard and need to analyze what is on this PC board.

73
Mark
N5RFX

At 11:02 AM 6/10/00 -0700, you wrote:
>The 10811 is a plug compatible replacement for instruments
>designed for a 10544. But the 10544 may not be not plug
>compatible with an instrument designed for a 10811 (since
>the 10544 requires extra power connections and is not
>designed to drive a 50R load).

>
>HP 10544 (AT cut)
>
>pin 1 - 10 MHz RF out (1000 R)
>pin 2 - ground
>pin 3 - Osc/Amp power *
>pin 4 - Osc/Amp/RF ground
>pin 5 - EFC ground
>pin 6 - EFC Input *
>pin 7 - NC
>pin 8 - Oven controller power *
>pin 9 - Oven controller ground
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
>- Oven controller power +10.6 to 11.7 VDC (5 mA)
>- Oven power is +15 to 30 VDC (2.5 W)
>- EFC control range is -5 to +5 VDC
>
>
>HP 10811 (SC cut)
>
>pin 1 - 10 MHz RF out (50 R)
>pin 2 - ground
>pin 3 - Osc supply *
>pin 4 - ground
>pin 5 - ground
>pin 6 - EFC Input *
>pin 7 - NC
>pin 8 - NC
>pin 9 - NC
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
>- Oven supply +20 to 30 VDC (2 W)
>- EFC control range is -5 to +5 VDC
>
>/tvb
>
>
>---
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>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

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27. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Mon, 12 Jun 2000 00:06:46 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90338-2000.06.12-02.09.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark et al,

I am sure that someone else is going to post the information
before I can get my manuals out of my file cabinet.

For general information: I have original manuals for the HP5328A,
HP5335A, HP5345A and for the HP10544A and HP10811A/B.

I am willing to share any information from these manuals, as long
as I am not going to be sued for copyright infringement.

And, thanks for asking, none of these manuals are for sale.

73

-- Flemming Larsen,   KB6ADS

> -----Original Message-----
> From: bounce-tacgps-17114@lists.tapr.org
> [mailto:bounce-tacgps-17114@lists.tapr.org]On Behalf Of
> mdmiller@fastlane.net
> Sent: Sunday, June 11, 2000 23:27
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: HP 10544A Oscillator pin-out needed
>
>
> This discussion is very timely for me. This weekend at Hamcom I
> purchased a
> HP 5328A with a 10811 inside. My 10811 is connected to another PC board
> through an edge card connector, and that PC board is connected through
> another edge card connector to a larger PC board. Does anyone have a
> schematic for the PC board that the 10811 is mounted to? I want to
> discipline the 10811 with the Brooks Shera's GPS-Controlled Frequency
> Standard and need to analyze what is on this PC board.
>
>
>
> 73
> Mark
> N5RFX
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] Re: HP 10544A Oscillator pin-out needed

From: Glenn Little <glittle@awod.com>
Date: Mon, 12 Jun 2000 07:50:01 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90370-2000.06.12-07.03.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark

I have a manual for the 5328A. I can photocopy section and mail to you if
you want. The board is the A3 Oscillato Support Assembly. It provides
regulated voltage, EFC, the ability to provide an external 1, 5 or 10 MHz
input and outputs of 1 and 10 MHz.

73
Glenn
WB4UIV

At 01:27 AM 6/12/00 -0500, you wrote:
>This discussion is very timely for me. This weekend at Hamcom I purchased
>a HP 5328A with a 10811 inside. My 10811 is connected to another PC board
>through an edge card connector, and that PC board is connected through
>another edge card connector to a larger PC board. Does anyone have a
>schematic for the PC board that the 10811 is mounted to? I want to
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>
>
>
>73
>Mark
>N5RFX
>
>At 11:02 AM 6/10/00 -0700, you wrote:
>>The 10811 is a plug compatible replacement for instruments
>>designed for a 10544. But the 10544 may not be not plug
>>compatible with an instrument designed for a 10811 (since
>>the 10544 requires extra power connections and is not

```
>>designed to drive a 50R load).
>>
>>HP 10544 (AT cut)
>>
>>pin 1  - 10 MHz RF out (1000 R)
>>pin 2  - ground
>>pin 3  - Osc/Amp power *
>>pin 4  - Osc/Amp/RF ground
>>pin 5  - EFC ground
>>pin 6  - EFC Input *
>>pin 7  - NC
>>pin 8  - Oven controller power *
>>pin 9  - Oven controller ground
>>pin 10 - NC
>>pin 11 - Oven monitor
>>pin 12 - NC
>>pin 13 - NC
>>pin 14 - Oven power *
>>pin 15 - Oven ground
>>
>>* Notes
>>- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
>>- Oven controller power +10.6 to 11.7 VDC (5 mA)
>>- Oven power is +15 to 30 VDC (2.5 W)
>>- EFC control range is -5 to +5 VDC
>>
>>
>>HP 10811 (SC cut)
>>
>>pin 1  - 10 MHz RF out (50 R)
>>pin 2  - ground
>>pin 3  - Osc supply *
>>pin 4  - ground
>>pin 5  - ground
>>pin 6  - EFC Input *
>>pin 7  - NC
>>pin 8  - NC
>>pin 9  - NC
>>pin 10 - NC
>>pin 11 - Oven monitor
>>pin 12 - NC
>>pin 13 - NC
>>pin 14 - Oven power *
>>pin 15 - Oven ground
>>
>>* Notes
>>- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
>>- Oven supply +20 to 30 VDC (2 W)
>>- EFC control range is -5 to +5 VDC
>>
>>/tvb
>>
>>
>>---
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>>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>---
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>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

-------------------------------------------------------------------------------
Glenn Little                        glittle@awod.com   QCWA  LM 28417
Amateur Callsign:  WB4UIV           wb4uiv@amsat.org   AMSAT LM 2178
QTH:  Goose Creek, SC USA (EM92xx)                     ARRL  TAPR
-------------------------------------------------------------------------------


---
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```

29. [tacgps] Re: HP 10544A Oscillator pin-out needed

```
From: "Paul J. Beckmann" <beckmann@scc.net>
Date: Mon, 12 Jun 2000 09:42:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90435-2000.06.12-09.46.07--lyris.tacgps#tapr.org@lists.tapr.org>
```

Rendered body type: text/plain

Hi, Mark.
  I working on the same thing. Have a pair of 5328As one with a 10811 inside
and one without but I purchased a 10544 with the board separately. If you
haven't, take a look at Brooks' website for details on the PIC, DAC
availability
etc. I just got a pair of boards from A&A so that stream is still intact.
73's
--Paul

>This discussion is very timely for me. This weekend at Hamcom I purchased a
>HP 5328A with a 10811 inside. My 10811 is connected to another PC board
>through an edge card connector, and that PC board is connected through
>another edge card connector to a larger PC board. Does anyone have a
>schematic for the PC board that the 10811 is mounted to? I want to
>discipline the 10811 with the Brooks Shera's GPS-Controlled Frequency
>Standard and need to analyze what is on this PC board.
>
>
>
>73
>Mark
>N5RFX
>

Paul Beckmann -- WA0RSE   1882 South Lane   wa0rse@amsat.org
ARRL/NLRS   Mendota Heights, MN   cell:612-414-0302
AMSAT #26957   55118-4328   fax:651-452-4103

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30. [tacgps] Re: Phase noise - Rb vs Xtal

From: Kohjin Yamada <kohjin@marina.prug.or.jp>
Date: Tue, 13 Jun 2000 17:33:12 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90681-2000.06.13-03.49.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,

Thank you very much for your description.
I expected had more feedback but it seems nothing anymore.

At 04:26 00/06/11 +0000, you wrote:

[several part snipped]

>Kohjin - a Rb standard consists of a crystal oscillator (like at 5 or 10
>MHz) locked to the 6.8+ Rb transition. Since a Rb is a crystal oscillator
>at short time scales, it will NEVER be more quiet than the crystal would be
>if it were running "nude".
>The short-term noise depends on how good is the crystal in the Rb.

...

>Some of the most modern Rb standards use a numerically controlled
>oscillator in the 6.8 GHz generation circuit, and they can make the FM
>signal without FM modulating the xtal itself. Other Rb standards use phase
>modulation in their multiplier/synthesizer chain, so the xtal frequency is
>not perturbed. But do not be surprised is you hear some audio FM (typically
>in the 50-200 Hz range) when you use a Rb at microwaves!

I don't know whether PRS10 uses a numerically control but it's specification
sheet tells "1000x less phase noise than Efratom", -125dBc vs -90dBc at 10Hz.
They claim -140dBc at 100Hz, -150dBc at 1kHz.

What I wanted to know was such an phase noise spec. for Efratom series
and nude Xtal which's disciplined by GPS.
I know it's not a simple task to measure phase noise but just wondered if
someone
had made it.

PRS10 at Standard Research Systems can be reached:

  http://www.srsys.com/html/prs10.html

ftp://ftp.batnet.com/pub/wombats/srsys/ftp/PDFs/Manuals/PRS10m.pdf

Only a problem it costs $1495!

>As I have said many times, the best way to visualize the performance of any
>of these standards is by looking at their Allan Variance. I have collected
>sample, typical AVARs for a number of standards in the plot at

Yes, Tom your AVARs (and many info's too) is always my bible.
And also same to HP's books too.

I will never forget a lecture "LO Phase-Noise Measurement in Amateur Receiver
Systems" made by Rick Campbell KK7B in MWU'99.
He finally concluded with the words, "Believe your ears".
Maybe I will use my ears for Xtal and Rb OSC at microwave range sometime.

Thanks again and sorry for the band width,

Kohjin - JR1EDE

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31. [tacgps] Test Equipment For Testing GPS recievers

From: Eric Haskell <ehaskell@airmail.net>
Date: Tue, 13 Jun 2000 21:39:10 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90829-2000.06.13-21.37.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I was curious as to how GPS receivers are tested during production?
Single channel source plus test mode? External antenna? Some sort of
satellite constellation simulator? Who makes this equipment?

Eric Haskell
KC4YOE

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32. [tacgps] Test Equipment For Testing GPS recievers

From: Brooke Clarke <brooke@pacific.net>
Date: Wed, 14 Jun 2000 13:34:33 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-90958-2000.06.14-15.37.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello:

I think the answer is all of them.

Stanford Telecom at one time (no more) made a test transmitter.
See my web page: http://www.pacific.net/~brooke/5001a/5001A.html
This was done because the birds were not yet in orbit.

Simulators are still used to test receivers where the desired signal is
not available form the satellites.
For example different levels of SA, different ionoshpere and
troposhphere effects, etc.

GSS has the inside cover ad in the May 2000 issue of GPS World.

CAST has an ad on page 7.

73,

Brooke - N6GCE

Subject: Test Equipment For Testing GPS recievers
From: Eric Haskell <ehaskell@airmail.net>
Date: Tue, 13 Jun 2000 21:39:10 -0500
X-Message-Number: 2

I was curious as to how GPS receivers are tested during production?

Single channel source plus test mode? External antenna? Some sort of
satellite constellation simulator? Who makes this equipment?

Eric Haskell
KC4YOE

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33. [tacgps] Re: tacgps digest: June 14, 2000

From: "Paul" <kelleypf@tiac.net>
Date: Thu, 15 Jun 2000 10:24:11 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-91069-2000.06.15-09.27.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

IFR instruments makes a test er !

Paul
----- Original Message -----
From: "TAPR Special Interest Group digest" <tacgps@lists.tapr.org>
To: "tacgps digest recipients" <tacgps@lists.tapr.org>
Sent: Thursday, June 15, 2000 1:00 AM
Subject: tacgps digest: June 14, 2000

> TAPR Special Interest Group Digest for Wednesday, June 14, 2000.
>
> 1. Test Equipment For Testing GPS recievers
>
> --
>
> Subject: Test Equipment For Testing GPS recievers
> From: Brooke Clarke <brooke@pacific.net>
> Date: Wed, 14 Jun 2000 13:34:33 -0700
> X-Message-Number: 1
>
> Hello:
>
> I think the answer is all of them.
>
> Stanford Telecom at one time (no more) made a test transmitter.
> See my web page: http://www.pacific.net/~brooke/5001a/5001A.html
> This was done because the birds were not yet in orbit.
>
> Simulators are still used to test receivers where the desired signal is
> not available form the satellites.
> For example different levels of SA, different ionoshpere and
> troposhphere effects, etc.
>
> GSS has the inside cover ad in the May 2000 issue of GPS World.
>
> CAST has an ad on page 7.
>
> 73,
>
> Brooke - N6GCE
>
>
> Subject: Test Equipment For Testing GPS recievers
> From: Eric Haskell <ehaskell@airmail.net>
> Date: Tue, 13 Jun 2000 21:39:10 -0500
> X-Message-Number: 2
>
> I was curious as to how GPS receivers are tested during production?
> Single channel source plus test mode? External antenna? Some sort of
> satellite constellation simulator? Who makes this equipment?
>
> Eric Haskell
> KC4YOE
>
>
>
>
> ---
>
> END OF DIGEST

>
> ---
> You are currently subscribed to tacgps as: kelleypf@tiac.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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34. [tacgps] Crystal Oscillators - good to read

From: Kohjin Yamada <kohjin@marina.prug.or.jp>
Date: Sat, 17 Jun 2000 00:11:11 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <dsp-10@qth.net>
Message-ID: <LYR6754-91252-2000.06.16-10.27.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Great reading titled "Introduction to Quartz Frequency Standards"

http://www.qct.nl/theory/toc.htm

Kohjin - JR1EDE

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

35. [tacgps] RE: Crystal Oscillators - good to read

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Fri, 16 Jun 2000 11:47:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-91259-2000.06.16-10.50.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Kohjin --

Thanks for the reference. I once met John Vig when I was at Ft. Monmouth.
Quite a nice guy and knows this business as much as anyone.

John

-----Original Message-----
From: bounce-tacgps-5605@lists.tapr.org
[mailto:bounce-tacgps-5605@lists.tapr.org]On Behalf Of Kohjin Yamada
Sent: Friday, June 16, 2000 11:11 AM
To: TAPR Special Interest Group
Cc: dsp-10@qth.net
Subject: [tacgps] Crystal Oscillators - good to read

Great reading titled "Introduction to Quartz Frequency Standards"

http://www.qct.nl/theory/toc.htm

Kohjin - JR1EDE

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---
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36. [tacgps] Post Processing

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Wed, 28 Jun 2000 8:5:57
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-93570-2000.06.28-08.09.59--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

If I read it right, I have found that NASA at JPL will process RINEX data
for free. Check out
http://www.unavco.ucar.edu/processing/gipsy/gipsy_info.html

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] Re: Post Processing

From: Brooks Shera <ebs@lanl.gov>
Date: Wed, 28 Jun 2000 17:51:45 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-93717-2000.06.28-18.52.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

When I tried using Auto gipsy some months ago it was not able to process
data that does not contain both L1 and L2 phase information. My only test
was to take their sample dataset and delete the L2 phase info - this
caused the Gipsy processor to fail. I suspect Gipsy uses arithmetic
combinations of L1 and L2 (wide-lane, narrow-lane) in ambiguity
resolution.

Brooks

>If I read it right, I have found that NASA at JPL will process RINEX data
>for free. Check out
>http://www.unavco.ucar.edu/processing/gipsy/gipsy_info.html

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38. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 29 Jun 2000 08:02:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-93842-2000.06.29-08.07.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> If I read it right, I have found that NASA at JPL will process RINEX data
> for free. Check out
> http://www.unavco.ucar.edu/processing/gipsy/gipsy_info.html

Lou Estey at UNAVCO (http://www.unavco.ucar.edu) has also got something
about post-processing for free. NGS has a program coming soon that will
do geodetic processing as a service, and can/will incorporate precise
ephemerides as well as network adjustments.

I obviously missed the first part of this thread, but I can generally
help with a little post-processing of RINEX/baseline data, too,
providing I'm not overloaded...
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Research focusing on
Computer Science Department |Satellite Geodesy and
Texas A&M University |Geodetic Control
979.458.4020 (Phone) -- 979.847.8578 (Fax)

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39. [tacgps] Re: Post Processing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 29 Jun 2000 08:36:26 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-93847-2000.06.29-08.41.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks Shera wrote:
>
> When I tried using Auto gipsy some months ago it was not able to process
> data that does not contain both L1 and L2 phase information. My only test
> was to take their sample dataset and delete the L2 phase info - this

> caused the Gipsy processor to fail. I suspect Gipsy uses arithmetic
> combinations of L1 and L2 (wide-lane, narrow-lane) in ambiguity
> resolution.

Your assumption is correct as far as I understand Gypsy, and most of the
geodetic processing code. I can set PAGES for L1-only if needed, but
then you lose some of the benefits associated with widelaning for search
in ambiguity resolution.

gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Research focusing on
Computer Science Department |Satellite Geodesy and
Texas A&M University |Geodetic Control
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40. [tacgps] Dramatized version of LONGITUDE is coming to TV

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 29 Jun 2000 18:27:19 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-93898-2000.06.29-13.31.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The British dramatized version of Dava Sobel's LONGITUDE describing John
Harrison's exploits is coming to TV on A&E starting July 9th at 8PM EDT.
Check the URL

        http://www.aande.com/tv/shows/longitude/

To anticipate a question, this is >>NOT<< the PBS NOVA version of
LONGITUDE. This dramatic show stars Jeremy Irons and Michael Gambon and
premiered as a Y2K special on BBC4. It was formerly available only in PAL
in the UK (see amazon.co.uk). W4PUJ saw the show in Europe reported it was
good.

73, Tom

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July 2000

Original source file: tacgps.0007
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0007

1. [tacgps] Heatsink for Ball Efratom FRK-C2

From: mdmiller@fastlane.net
Date: Mon, 03 Jul 2000 10:17:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94564-2000.07.03-10.35.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anyone know where I can purchase a heatsink for Ball Efratom FRK-C2?

73
Mark
N5RFX

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] RE: Heatsink for Ball Efratom FRK-C2

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 3 Jul 2000 10:33:00 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94568-2000.07.03-10.42.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

try: http://www.lehmanscientific.com/ . He sells the units, but he may
have a bad one or two.....

> ----------
> From: mdmiller@fastlane.net[SMTP:mdmiller@fastlane.net]
> Reply To: TAPR Special Interest Group
> Sent: Monday, July 03, 2000 10:17 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Heatsink for Ball Efratom FRK-C2
>
> Does anyone know where I can purchase a heatsink for Ball Efratom FRK-C2?
>
> 73
> Mark
> N5RFX
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

3. [tacgps] Re: RE:Single Antenna Multiple Receivers

From: GS <gsanders1@bigfoot.com>
Date: Tue, 04 Jul 2000 22:23:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94800-2000.07.04-21.27.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim Korenz wrote:
>
> Hi All,
>   I have been using the RCA DSS splitter model D800
> from Radio Shack. The freq range is listed as 40-2150
> MHz and it includes the steering diodes to power the
> GPS antenna. I think it costs about $12. It has 3 "F"
> connectors and is 75 ohms, but I use 3 BNC to "F"
> adapters and have had no problems. I have the older
> Motorola "hockey puck" antenna with about 30 feet of
> RG-58 through the basement window. I have run a VP as
> the DGPS ref station and have used a VP, GPS III, and
> Magellan XL as rovers. The only problem with this
> arrangement is that the highest voltage will power the
> antenna. If your receiver senses current, none of mine
> did, it may complain.
>   Jim Korenz   N8PXW

I realize that I'm replying to a message that's over two
month's old - what can I say - I'm slow!

I (finally) got one of the RCA DSS splitters and amp
at RS, and it works well with my M12, but when I try to
use it with both the M12 and my shiny new Garmin eMap,
the eMap doesn't seem to want to utilize it. Does anybody
know if the eMap needs to see current flow on the antenna
cable to force it to switch from the internal antenna?

When I initially connected it to the splitter and M12,
I thought it wasn't doing too badly - I saw three or
four sats. Then, I disconnected the RG174 from the splitter,
and STILL saw the same sats with the end of the 174 dangling
in midair! Either the eMap's internal patch is still working
when the RG174 is connected but unterminated in a proper
antenna, or I've hit upon the GPS version of tin foil
on the rabbit ears. (Actually, I verified that the eMap's
patch is still active by covering it with my hand.)

Any thoughts on how I can fake the eMap into seeing the
external splitter/amp/antenna? Preferably cheaply :-)

Gary Sanders   WB0BZR

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4. [tacgps] Re:Single Antenna Multiple Receivers

From: Dave Martindale <davem@cs.ubc.ca>
Date: Tue, 04 Jul 2000 22:11:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94819-2000.07.05-00.15.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I (finally) got one of the RCA DSS splitters and amp
>at RS, and it works well with my M12, but when I try to
>use it with both the M12 and my shiny new Garmin eMap,
>the eMap doesn't seem to want to utilize it. Does anybody
>know if the eMap needs to see current flow on the antenna
>cable to force it to switch from the internal antenna?

The eMap is almost certainly the same as the 12XL: it senses current
drawn from the antenna jack to operate an internal switch that selects
between the internal antenna and the external jack. Connect a passive
antenna (no current drawn) or a DC-blocked signal splitter, and the
GPS simply ignores the external signal.

To fix this, you simply have to draw sufficient current from the
antenna jack - 5 mA seems sufficient for modern Garmins, but some of
the really early 12XLs (I had one) needed closer to 10 mA.

If your antenna will operate from 2.5 V, the simplest thing is to
just use the eMap as the power source for it by connecting the eMap
to a splitter port with a DC connection to the antenna, and connect
the M12 to a DC-isolated port.

Failing that, connect about 500 ohms of resistance between signal and
shield somewhere between the splitter and the eMap. That should draw
enough current even at 2.5 V to activate the switch, without loading
the RF signal significantly.

        Dave

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5. [tacgps] GravNav Lite

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Wed, 5 Jul 2000 12:9:26
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94904-2000.07.05-12.13.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Anybody have any experience or comments on using GravNav Lite with the
Oncore VP ?

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re:Single Antenna Multiple Receivers

From: GS <gsanders1@bigfoot.com>
Date: Wed, 05 Jul 2000 16:57:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-94934-2000.07.05-16.01.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dave Martindale wrote:
>
> If your antenna will operate from 2.5 V, the simplest thing is to
> just use the eMap as the power source for it by connecting the eMap
> to a splitter port with a DC connection to the antenna, and connect
> the M12 to a DC-isolated port.
>
> Failing that, connect about 500 ohms of resistance between signal and
> shield somewhere between the splitter and the eMap. That should draw
> enough current even at 2.5 V to activate the switch, without loading
> the RF signal significantly.

I got it working....

Unfortunately, the external antenna didn't like the 2.5 volts
from the eMap, so I went the resistor route. I simply added a
BNC T connector between the splitter output and the eMap, and
added a 510 ohm termination to one leg of the T. It seems to
work great, with reasonable signal strength on the GPS Data
screen of the eMap, and it sees all the sats that the M12 is
seeing. Thanks much for the suggestion.

Gary Sanders   WB0BZR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] GPS Antenna

From: Derek Lassen <kn6td@clubnet.net>
Date: Thu, 06 Jul 2000 02:29:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95022-2000.07.06-04.34.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have seen articles about home brewing GPS flat plate antennas, but can't
finf the pointer right now.
Can anybody here recall any?

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

8. [tacgps] Re: GPS Antenna

From: Robert Winingham <kc5ejk@onramp.net>
Date: Thu, 6 Jul 2000 11:57:01 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95077-2000.07.06-11.59.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I have seen articles about home brewing GPS flat plate antennas, but can't finf the pointer right now.
>Can anybody here recall any?
>

Don't forget this list like several others is available at www.tapr.org
and the archives are searchable.

I searched the archives and got several hits on the word
PATCH

here is one

Date: Wed, 21 Jul 1999 21:11:30 -0400

From: SCHULTZ@CDDIS.GSFC.NASA.GOV
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
CC: SCHULTZ@CDDIS.GSFC.NASA.GOV
Subject: [tacgps] New Dielectric Patch Antenna at Digikey
List-Owner: <mailto:owner-tacgps@lists.tapr.org>
Reply-To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
X-Message-Id: <990721211130.30e@CDDIS.GSFC.NASA.GOV>
Sender: bounce-tacgps-5723@lists.tapr.org
Precedence: bulk
Status: RO

Just got the new Digikey catalog. On page 292 they have a Dielectric
Patch antenna from Toko, for GPS. Resonates at 1580.5 MHz, frequency
shifts 5 MHz lower with a radome. Measures about 1 inch square.

Part Number TK5150-ND, price $17.33

Dan Schultz N8FGV

73

--

-----   kc5ejk@onramp.net   or kc5ejk@amsat.org   -----

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] Re: GPS Antenna

From: Dave Martindale <davem@cs.ubc.ca>
Date: Thu, 06 Jul 2000 10:26:21 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95081-2000.07.06-12.30.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Another source: there's an article in the October 1995 QST magazine (page 44)
that describes how to make a patch antenna from sheet metal and nylon
spacers. This is a passive antenna.

I've also heard about someone starting with this design, but using PC board
material instead of sheet metal for the ground plane. The upper side of
the PC board was left as continuous copper, to perform as a ground plane
for the antenna, while the underside of the PC board carried a preamp
consisting of a modular 50 ohm preamp device (e.g. one of the MAR series)
plus whatever resistors and capacitors were needed for biasing it.

Another possibility, though not a patch: Somewhere in the archives of this
list you should find a description of a 2-turn helix antenna wound on a
yoghurt container with an active preamp.

        Dave

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Re: GPS Antenna & more...

From: Mastenbrook Gary-G13216 <Gary.Mastenbrook@motorola.com>
Date: Thu, 6 Jul 2000 16:10:10 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95104-2000.07.06-16.14.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Seeing this post reminds me that I have some of these antennas too. (Maybe
two or three boxes if I remember right.) They are new-old stock and I've
been selling a pair of them for $10.00 (+ $3.00 S/H USPS priority mail).
<USA ONLY>

>From the home webpage: http://www.qsl.net/n8dmt/extras1.html

NEW/Surplus GPS Patch Antennas (non-amplified).   These are approx. 1"
square ceramic patches with a ground plane on the back with a small pin
protruding out of the back side for your coaxial cable attachment. These
are "raw" antennas ready for your housing and pre-amplifier (as needed).
Quantity available.

I've used them mounted on a 2" square groundplane without the preamplifier
for short cable runs. As stated by digikey, a cover dielectric is used to
tune the patch to the correct frequency. Just vary the height between the
patch and the cover until the receiver signal strength peaks. Having taken
apart an Antenna97 recently, I was amazed at how similar these surplus
patches looked to the one in this $50 antenna...

These are quite popular at hamfests given the increased interest in APRS and
GPS systems. I still have quite a few available if anyone's interested.
(Just don't make it to enough hamfests to clean out the boxes, I guess...
:o)

Please email me at n8dmt@home.com for further passive patch information or
to request a pair-o-patches be sent to you. Please do not reply back to the
list with an order request. Thanks!

ALSO: If list readers are interested in other GPS goodies, please drop me an
email at n8dmt@home.com. I'll be cleaning out the shack at some point this
month and should find some extra UT's, GT's and old/new style antennas.
Once I know what you're looking for, I'll put together a list of
who-wants-what and contact you first-come, first served after the 'great
clean-up' is over. Prices will be very reasonable (always sell out at
Dayton--but didn't go this year). Thank you. <USA ONLY>

73's

Gary N8DMT

-----Original Message-----
From: Robert Winingham [mailto:kc5ejk@onramp.net]
Sent: Thursday, July 06, 2000 11:57 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: GPS Antenna

>I have seen articles about home brewing GPS flat plate antennas, but can't
find the pointer right now.
>Can anybody here recall any?
>

Don't forget this list like several others is available at www.tapr.org
and the archives are searchable.

I searched the archives and got several hits on the word
PATCH

here is one

Date: Wed, 21 Jul 1999 21:11:30 -0400
From: SCHULTZ@CDDIS.GSFC.NASA.GOV
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
CC: SCHULTZ@CDDIS.GSFC.NASA.GOV
Subject: [tacgps] New Dielectric Patch Antenna at Digikey
List-Owner: <mailto:owner-tacgps@lists.tapr.org>
Reply-To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
X-Message-Id: <990721211130.30e@CDDIS.GSFC.NASA.GOV>
Sender: bounce-tacgps-5723@lists.tapr.org
Precedence: bulk
Status: RO

Just got the new Digikey catalog. On page 292 they have a Dielectric
Patch antenna from Toko, for GPS. Resonates at 1580.5 MHz, frequency
shifts 5 MHz lower with a radome. Measures about 1 inch square.

Part Number TK5150-ND, price $17.33

Dan Schultz N8FGV

73

--

-----   kc5ejk@onramp.net   or kc5ejk@amsat.org   -----

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] Patch Antennas

From: Derek Lassen <kn6td@clubnet.net>
Date: Fri, 07 Jul 2000 02:01:53 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95227-2000.07.07-04.07.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Oct 95 - I think that was the one I was remembering.
Thanks.

I just read the article off the CDROM (great idea, these magazine archives
on CD).

Excellent!

But now I want to find a book!

Anybody have Antenna Design Using Personal Computers by David M. Pozar,
(Dedham, MA: Artech House, Inc, 1985) which is referenced in the QST article?

Or the software that came with it?

Amazon says it is out of print (figures).

Or can anybody recommend a better book?

And thanks for all the other responses.

73 de KN6TD
(s) Derek

12. [tacgps] Oncore UT

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sat, 8 Jul 2000 13:15:00 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95414-2000.07.08-13.19.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gary -

As you are looking trhough the surplus ....if you've got a spare Oncore UT,
and new style antenna .... I can replace my current VP used with TAC-2 and
move it onto the new project !

GB
----- Original Message -----
From: "Mastenbrook Gary-G13216" <Gary.Mastenbrook@motorola.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, July 06, 2000 4:10 PM
Subject: [tacgps] Re: GPS Antenna & more...

> Seeing this post reminds me that I have some of these antennas too.
(Maybe
> two or three boxes if I remember right.) They are new-old stock and I've
> been selling a pair of them for $10.00 (+ $3.00 S/H USPS priority mail).
> <USA ONLY>
>
> From the home webpage: http://www.qsl.net/n8dmt/extras1.html
>
> NEW/Surplus GPS Patch Antennas (non-amplified).   These are approx. 1"
> square ceramic patches with a ground plane on the back with a small pin
> protruding out of the back side for your coaxial cable attachment. These
> are "raw" antennas ready for your housing and pre-amplifier (as needed).
> Quantity available.
>
>
> I've used them mounted on a 2" square groundplane without the preamplifier
> for short cable runs. As stated by digikey, a cover dielectric is used to
> tune the patch to the correct frequency. Just vary the height between the
> patch and the cover until the receiver signal strength peaks. Having
taken
> apart an Antenna97 recently, I was amazed at how similar these surplus
> patches looked to the one in this $50 antenna...

>
> These are quite popular at hamfests given the increased interest in APRS
and
> GPS systems. I still have quite a few available if anyone's interested.
> (Just don't make it to enough hamfests to clean out the boxes, I guess...
> :o)
>
> Please email me at n8dmt@home.com for further passive patch information or
> to request a pair-o-patches be sent to you. Please do not reply back to
the
> list with an order request. Thanks!
>
> ALSO: If list readers are interested in other GPS goodies, please drop me
an
> email at n8dmt@home.com. I'll be cleaning out the shack at some point
this
> month and should find some extra UT's, GT's and old/new style antennas.
> Once I know what you're looking for, I'll put together a list of
> who-wants-what and contact you first-come, first served after the 'great
> clean-up' is over. Prices will be very reasonable (always sell out at
> Dayton--but didn't go this year). Thank you. <USA ONLY>
>
> 73's
>
> Gary N8DMT
>
> -----Original Message-----
> From: Robert Winingham [mailto:kc5ejk@onramp.net]
> Sent: Thursday, July 06, 2000 11:57 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: GPS Antenna
>
>
> >I have seen articles about home brewing GPS flat plate antennas, but
can't
> find the pointer right now.
> >Can anybody here recall any?
> >
>
> Don't forget this list like several others is available at www.tapr.org
> and the archives are searchable.
>
>
> I searched the archives and got several hits on the word
> PATCH
>
> here is one
> ---
> Date: Wed, 21 Jul 1999 21:11:30 -0400
> From: SCHULTZ@CDDIS.GSFC.NASA.GOV
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> CC: SCHULTZ@CDDIS.GSFC.NASA.GOV
> Subject: [tacgps] New Dielectric Patch Antenna at Digikey
> List-Owner: <mailto:owner-tacgps@lists.tapr.org>
> Reply-To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> X-Message-Id: <990721211130.30e@CDDIS.GSFC.NASA.GOV>
> Sender: bounce-tacgps-5723@lists.tapr.org
> Precedence: bulk
> Status: RO
>
> Just got the new Digikey catalog. On page 292 they have a Dielectric
> Patch antenna from Toko, for GPS. Resonates at 1580.5 MHz, frequency
> shifts 5 MHz lower with a radome. Measures about 1 inch square.
>
> Part Number TK5150-ND, price $17.33
>
> Dan Schultz N8FGV
>
> ---
>
> 73
>
> --
>
> -----   kc5ejk@onramp.net   or kc5ejk@amsat.org   -----
>
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET

> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: GravNav Lite

From: Jeff <barnie@flash.net>
Date: Sat, 08 Jul 2000 14:00:06 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95439-2000.07.08-16.04.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I was waiting for someone with more direct experience to write, but I see
no one has. I have used GravNav Lite indirectly. I wanted to know the
precise location of my home GPS antenna as it is used for a local DGPS
reference station (or at least it was until SA was shut off). I got in touch
with David Wilson, and he volunteered to post process data from my VP
and the local CORS station to find my home position. I took data on
several different occations and then David processed it. We found the
resulting position solution to be within 10-15 cm between all the runs.
The program could do its magic with about 1 hour of data, but we used
various times from 1 hour to 24 hours. The program seemed very effective
although you should probably email David Wilson to get first-hand info.
You can check out his website at: http://users.erols.com/dlwilson/gps.htm

Jeff Vollin

Brian Kirby wrote:

> Anybody have any experience or comments on using GravNav Lite with the
> Oncore VP ?
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: Patch Antennas

From: W4OQM@aol.com
Date: Sat, 8 Jul 2000 22:25:30 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95479-2000.07.08-21.30.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My most frequently used reference for antenna designs is:

The Antenna Engineering Handbook, 3rd Ed.
Richard C. Johnson
McGraw-Hill, 1993

Chapter 7 is on Microstrip Antennas (a.k.a. Patch Antennas).

The book is a bit expensive, so you may want to dig up a copy and look at it
before you buy it.

73,
Charlie -- W4OQM
c.wells@ieee.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Longitude Reminder

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 09 Jul 2000 19:47:32 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95562-2000.07.09-14.51.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A reminder that A&E starts the 4-part fictionalized and romanticized
version of Dava Sobel's LONGITUDE tonite (20:00-21:00 EDT). This is the
story of John Harrison and his clocks and his efforts to win the 20,000
pound prize, and of Gould's efforts in the 1920's to rebuild them from the
pieces found in a warehouse.

A&E's web site at http://www.AandE.com/tv/shows/longitude/ has details
about the show. If you miss it, the A&E website says that VHS and DVD
copies will be available 8/1/2000.

Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Longitude reminder

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sun, 9 Jul 2000 17:09:34 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95569-2000.07.09-16.14.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the reminder Tom.
According to my program guide, it's one continuous 4-hour show (8PM - 12M
EDT) to be repeated 12M - 4AM EDT.
Going to be a LONG night. Hope I can stay awake. If it's as good as the book
I shouldn't have any problem. Couldn't put the book down until I finished
it.

73   John

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] LONGITUDE -- A correction

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 09 Jul 2000 22:07:52 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Jim Read <jimread@earthlink.net>
Message-ID: <LYR6754-95573-2000.07.09-17.12.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

After I posted my reminder, I was setting up the VCR and see from the DSS
on-screen schedule that A&E is carrying all 4 hours in one marathon burst.
The times are 20:00-24:00 EDT and then repeat west-coast feed from 00:00 to
04:00 EDT. I see that John Pringle also noticed this and posted a notice.
Sorry for the goof.

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] [tacgps]Re>Longitude reminder

From: Bill Powell <bpowell@intrex.net>
Date: Mon, 10 Jul 2000 02:11:27 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95634-2000.07.10-01.18.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My program guide agrees with John's. It also says there will be a
repeat on A&E this Tuesday - first show 8PM-Midnight, with a second
showing from Midnight-4AM.

Regards,
Bill Powell   af4jg

"John K. Pringle" wrote:
>
> Thanks for the reminder Tom.
> According to my program guide, it's one continuous 4-hour show (8PM - 12M
> EDT) to be repeated 12M - 4AM EDT.
> Going to be a LONG night. Hope I can stay awake. If it's as good as the book

> I shouldn't have any problem. Couldn't put the book down until I finished
> it.
>
> 73   John
>
> ---
> You are currently subscribed to tacgps as: BPOWELL@INTREX.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] Software for patch antennas

From: Derek Lassen <kn6td@clubnet.net>
Date: Mon, 10 Jul 2000 14:54:17 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95729-2000.07.10-16.59.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks to the pointer, I found the following software for calculating
dimensions, etc of patch (an other) antennas.

http://rf.rfglobalnet.com/software_modeling/software/3/413.htm

I have not tried the software yet

Again, thanks.

73 de KN6TD

(s) Derek

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] Re:> Longitude encore show reminder

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Mon, 10 Jul 2000 20:05:14 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95746-2000.07.10-20.11.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I just saw the promo for repeat (encore) of Longitude .... 8 p.m. eastern /
7 p.m. central

GB
----- Original Message -----
From: "Bill Powell" <bpowell@intrex.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, July 10, 2000 1:11 AM
Subject: [tacgps] [tacgps]Re>Longitude reminder

> My program guide agrees with John's. It also says there will be a
> repeat on A&E this Tuesday - first show 8PM-Midnight, with a second
> showing from Midnight-4AM.
>
> Regards,
> Bill Powell   af4jg
>
>
> "John K. Pringle" wrote:
> >
> > Thanks for the reminder Tom.
> > According to my program guide, it's one continuous 4-hour show (8PM -
12M
> > EDT) to be repeated 12M - 4AM EDT.
> > Going to be a LONG night. Hope I can stay awake. If it's as good as the
book
> > I shouldn't have any problem. Couldn't put the book down until I
finished
> > it.
> >
> > 73   John
> >
> > ---

> > You are currently subscribed to tacgps as: BPOWELL@INTREX.NET
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Antennas

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Tue, 11 Jul 2000 6:55:15
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95812-2000.07.11-06.59.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I had a Motorola Antenna 97 failure. The symptoms was one day the receiver
started losing lock for a few seconds at a time. Then the next day it
failed for 33 minutes. And the next day it died and did not come back.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] RE: Antennas

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 11 Jul 2000 09:00:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-95834-2000.07.11-09.07.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Your message was not delivered to the following recipients:
Gary_Mastenbrook-g13216@email.mot.com: Ambiguous name
Reporting-MTA: dns;m-il06-r2.mot.com
Final-Recipient: rfc822;Gary_Mastenbrook-g13216@email.mot.com
Action: failed
Status: 5.1.4

I'd like to take you up on the offer, but I know it went out in Monday's
trash. I have ordered some replacements from TAPR. And, I appreciate the
thought.

It was not pretty when I got thru inspecting it. It was epoxied to a
homemade chokering. The only thing I found was water, but it had not went
past the seal. I did not see any failed components.

If I lose another, I'll hold on to it for you. I bought 3 of them at the
same time. I don't think it was a lot problem, as the other two are in use
and working fine (24hrs a day since December 1999).

From: Mastenbrook Gary-G13216[SMTP:Gary_Mastenbrook-g13216@email.mot.com]
Sent: Tuesday, July 11, 2000 8:40 AM
To: 'brian.kirby@msfc.nasa.gov'
Subject: RE: [tacgps] Antennas

        Brian,
Would you accept the offer for another antenna (used, but in good & working
condition) for your failed one? I'd like to return your unit to the quality

director at Motorola TCG responsible for these products.....

> ----------
> From: Brian Kirby[SMTP:brian.kirby@msfc.nasa.gov]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, July 11, 2000 1:55 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Antennas
>
> I had a Motorola Antenna 97 failure. The symptoms was one day the
> receiver
> started losing lock for a few seconds at a time. Then the next day it
> failed for 33 minutes. And the next day it died and did not come back.
>

>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

23. [tacgps] ARRL and TAPR 19th Annual Digital Communications Conference

From: "Steven R. Bible" <n7hpr@tapr.org>
Date: Tue, 18 Jul 2000 19:20:23 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97252-2000.07.18-18.25.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

ARRL and TAPR   19th Annual
Digital Communications Conference
September 22-24, 2000 - Orlando, Florida

For more information see: http://www.tapr.org/dcc

Information
Mark your calendar and start making plans to attend the year's premier
event in digital communications. The 19th Annual ARRL and TAPR
Digital Communications Conference will be held September 22-24, 2000,
in Orlando, Florida - just minutes from the Orlando International
Airport.

The ARRL and TAPR Digital Communications Conference is an
international forum for radio amateurs in digital communications,
networking, and related technologies to meet, publish their work, and
present new ideas and techniques for discussion. Presenters and
attendees will have the opportunity to exchange ideas and learn about
recent hardware and software advances, theories, experimental results,
and practical applications. The Digital Communications Conference is
not just for the digital expert, but also for digitally oriented
amateurs of all levels of experience.

A Conference for the Beginner as well
The conference is not just for the digital expert. As in years past
an entire session strand with beginning, intermediate, and advanced
presentations on selected topics in digital communications will be
offered. Some of the topics will include: APRS, Satellite
Communications, TCP/IP, Digital Radio, Spread Spectrum and other
introductory topics. Come to the conference and hear these topics
presented by the experts!

Area Attractions
The Orlando Florida area is famous for its attractions and vacation
spots. Disney World, Universal Studios, and Sea World (just to name a
few) are within 15 minutes of the hotel. Shuttle service from the
hotel will be available for a small fee. Cape Canaveral and Cocoa
Beach are a 30 minute drive East of the hotel.

Symposia, Seminars and Banquet
Two symposia/seminars will be held which allow those with additional
time and interest to make the most of the Conference. For those who
may have interest in just one symposium or seminar, registration for
the conference is not required to attend these activities. This allows
maximum flexibility for those who may want to participate during the
Digital Communications Conference, but do not have an entire weekend
to devote to the event.

The Fourth APRS National Symposium will be held on Friday and will be
moderated by Steve Dimse, K4HG (the developer of javAPRS). It will
likely include many APRS software authors, such as Bob Bruninga,
WB4APR (the father ofAPRS), Keith Sproul, WU2Z, Mark Sproul, KB2ICI
(the developers of MacAPRS and WinAPRS), Brent Hildebrand, KH2Z (the
developer of APRSPLUS), Mike Musick, N0QBF (developer of PocketAPRS),
and other nationally known APRS leaders. Join this group for the
afternoon and evening for in-depth discussions and presentations on
the current and future status of APRS. This is a unique opportunity to
gain insight into this fast-growing digital aspect of amateur
operations that combines computers, packet radio, and GPS (Global
Positioning System).

On Saturday night the DCC Banquet will be held. A guest speaker will
speak after the banquet and a prize drawing will top the evening. The
Grand Prize is a Palm VII Personal Digital Assistant.

The Sunday morning seminar will be focused on PIC development,

design, and programming. This five-and-a-half hour seminar will focus on the things you need to know now in order to understand and begin to participate in PIC development.

Co-Hosts
The 2000 ARRL and TAPR Digital Communications Conference local co-hosts will be Lake Monroe Amateur Radio Society (http://www.qsl.net/lmars/),Orange County ARES/RACES(http://evcom.net/~jvoisin/ares.htm), Seminole County ARES/RACES (http://wwww.geocities.com/capecanaveral/launchpad/4773), and Orlando Amateur Radio Club(http://www.oarc.org/).

International Co-Hosts PRUG (Packet Radio User Group of Japan) will be the International co-host for a third year running. PRUG will be hosting an informal social Friday evening before their seminar and symposium is held. Visit http://www.prug.or.jp for more information about PRUG.

Call for Papers
Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the Conference is not required for publication. Papers are due by August 7th, 2000, and should be submitted to

Maty Weinberg, ARRL
225 Main Street
Newington, CT 06111

or via the Internet to

   lweinberg@arrl.org

Information on paper submission guidelines are available on-line at

   http://www.tapr.org/dcc

Hotel
Conference presentations, meetings, and seminars will be held at the Orlando Airport Marriott. It is highly recommended that you book your room prior to arriving. A special DCC room rate of $89/single and $89/double per night has been blocked for 50 rooms and is available until September 1st, 2000. Once the 50 rooms have been reserved, room rates will increase. So be sure to book your rooms early! The hotel provides transportation to and from the Orlando International Airport. Please contact the hotel to arrange specific transportation needs.

Orlando Airport Marriott (conference hotel)
7499 Augusta Drive
Orlando, FL 32822
Phone 407-851-9000, Fax 407-857-6211
(http://marriotthotels.com/MCOAP/)

What you can expect at DCC 2000
- A full day of papers and breakouts for the beginner to the advanced
- Two seminars/symposiums
- The fifth annual Student Paper session.
- A banquet with Special Guest Speaker.
- Informal get-togethers throughout the weekend.
- TAPR Membership Meeting
- An event at which the most important new developments in amateur digital communications are announced.
- Digital 'movers and shakers' from all over the world in attendance.

There are few activities where your participation can be so much fun and important! What a great way to share and renew your enthusiasm for digital amateur radio! A get-together with colleagues and bringing each other up to date on your latest work -- all this, and more, for an unforgettable weekend of amateur radio and digital communications. We hope to see you at the ARRL and TAPR Digital Communications Conference on September 22-24, 2000!

Full information on the conference and hotel information can be obtained by contacting:

Tucson Amateur Packet Radio
Phone: (940) 383-0000.
Fax: (940) 566-2544
Email: tapr@tapr.org
Web: http://www.tapr.org

Registration Form
Contact the TAPR office by Phone 940-383-0000, Fax 940-566-2544, or
Internet: http://www.tapr.org and tapr@tapr.org to register or for
additional information.

Conference Registration includes: Conference Proceedings, Sessions,
Meetings, and Lunch on Saturday.

- Pre-Registration (before Sept 1st)

$45.00 _____

- Registration (after Sept 1) or at door

$55.00 _____

- Saturday Evening Dinner (Limited Space)
Dinner with Guest Speaker
Prize Drawing

$30.00 _____

Symposia/Seminars

- 4th Annual APRS National Symposium
Friday, 1pm - 7pm. $25.00 _____

- Sunday Seminar
PIC Design, Development, and Programming

Sunday, 8:30 am - 2 pm. $20.00 _____

TOTAL _____

Name/Call:

Street Address:

City/State/Zip:

Country:

Phone Number:

Email:

Charge my credit card (circle one):

VISA MasterCard

Acct:

Expiration Date:

Signature on card:

Mail completed registration form with check to:
TAPR
8987-309 E Tanque Verde Rd #3378
Tucson, AZ 85749-9399

Or check http://www.tapr.org/dcc for an on-line registration form.

A registration packet will be mailed in September upon receipt of
registration form and payment.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: Longitude Reminder

From: "Pete Prossen" <prossen@znet.com>
Date: Tue, 18 Jul 2000 20:14:19 -0700

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97288-2000.07.18-22.14.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I taped Longitude for rescheduled viewing rather than try to stay on the couch for 4 hours.

But it is so heavily polluted with commercials that the continuity of this great story is lost. And I know this will get worse further in to the story.

The DVD is available, delivered and with tax, for $49.46. But that's beyond my threshold of price resistance to watch even this fine presentation.

Is there anyone in the North San Diego County area that would like to share ownership with me?

Pete Prossen
WA6ZUH
prossen@znet.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: Longitude Reminder

From: "Steve Sampson" <ssampson@usa-site.net>
Date: Tue, 18 Jul 2000 22:24:09 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97290-2000.07.18-22.30.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I concur on the number of commercials. And not one Timex commercial in all that! I went to go feed my cat on the 40th commercial and forgot to come back and see the end...

I missed the point of the guy in the chase scene who ended up in the nuthouse??

----- Original Message -----

> But it is so heavily polluted with commercials that the continuity of this
> great story is lost. And I know this will get worse further in to the
> story.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Help with TAC-2?

From: "Scott O'Connell" <scotto@sds.com>
Date: Tue, 18 Jul 2000 20:27:16 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97291-2000.07.18-22.32.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've been running my TAC-2 for a few weeks now, and just got around to getting a battery for the UPS option.

I picked up a PowerSonic PS-1208, 12V, .8Ah battery that fits nicely in the case I used.

Would anyone be willing to help me get this battery connected properly? I'm a little unsure about the installation, especially the proper values for the slow and fast charging resistors, and whatever else might be needed. The docs at the bottom of page 16 of the assembly manual aren't enough for me! :-)

Any help is greatly appreciated.

Feel free to take this off the list. scotto@sds.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: Longitude Reminder

From: "Ira A. Wilner" <bdcst@sover.net>
Date: Wed, 19 Jul 2000 09:12:03 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97364-2000.07.19-08.16.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

-----Original Message-----
From: Steve Sampson <ssampson@usa-site.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Date: Tuesday, July 18, 2000 11:26 PM
Subject: [tacgps] Re: Longitude Reminder

>I concur on the number of commercials. And not one Timex
>commercial in all that! I went to go feed my cat on the 40th
>commercial and forgot to come back and see the end...
>
>I missed the point of the guy in the chase scene who ended up
>in the nuthouse??
>

I tuned in to the final hour and struggled to get the gist of it. It
didn't help that I tuned away during the commercial breaks and lost even
more of the story! The commercial break excesses made it intolerable.

So, what was the point of this melodramatic film? And what, if any of it,
was historically correct? Weren't early ships clocks wall mounted devices,
and not oversized pocket watches as depicted in the film?

I think Longitude had the wrong (L)attitude.

--Ira

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] Re: Longitude Reminder

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Wed, 19 Jul 2000 09:40:57 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97365-2000.07.19-08.45.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Early ship chronometers, and more recent ones, were gimbal mounted in
wooden boxes about six to eight inches cubed.

John

>-----Original Message-----
>From: Steve Sampson <ssampson@usa-site.net>
>To: TAPR Special Interest Group <tacgps@lists.tapr.org>
>Date: Tuesday, July 18, 2000 11:26 PM
>Subject: [tacgps] Re: Longitude Reminder
>

>So, what was the point of this melodramatic film? And what, if any of it,
>was historically correct? Weren't early ships clocks wall mounted devices,
>and not oversized pocket watches as depicted in the film?
>
>I think Longitude had the wrong (L)attitude.
>
>--Ira
>
>
>---

>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] RINEX Format from GPS25 Data

From: "Bruce Block" <bpblock@umich.edu>
Date: Wed, 19 Jul 2000 10:7:15
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97396-2000.07.19-10.12.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Re the post-processing thread of 6/28/00, I have been impressed
with the results that I have obtained using C/A code and phase data from
my GPSIII+ and the GeoGenius Basic software package. I am currently
modifying the Antonio Tabernero "async" software to read GPS25
binary data and convert it to RINEX, but it occurs to me that someone
may already have written something similar. Anybody know of such software
(preferably available in source form)?

Bruce W8XN

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

30. [tacgps] GPS Surveying Asst't Software

From: Brooks Shera <ebs@lanl.gov>
Date: Thu, 20 Jul 2000 09:10:50 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97625-2000.07.20-10.11.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have written some JavaScript/HTML software that is handy for relating
GPS position measurements (WGS-84) to local surveying coordinates, and
has several other useful features of possible interest to tacgps folks.

Briefly, given accurate GPS coordinates (latitude, longitude) for a pair
of points that can be located on a local survey plat, this program
computes the angular offset and distance scaling needed to transfer GPS
measurements to the local survey. When these offset and scaling factors
have been determined, the WGS-84 latitude and longitude of other
locations on the survey plat can be computed. This information allows
surveyed locations to be accurately located on the ground using a GPS
receiver.

For people not interested in surveying, the program can do some other
potentially useful calculations. For example, given GPS coordinates and
heights of two locations, the program can compute the bearing, distance,
and elevation (above the horizon) of the line-on-sight path between them.
This latter feature is rarely seen in navigation programs, which
typically assume both stations are at sea level. It is useful for those
who seek to identify distant mountains by their bearing and angle above
the horizon, since it can also solve the inverse problem (given a bearing
& distance it will compute a position). It is also useful for estimating
line-of-site radio paths between two locations. To account for
atmospheric diffraction the earth's radius is increased in the
line-of-sight calculation by 16.2% for optical and 33.3% for radio
frequencies. But that's getting into the details.

The software can used on-line on my website www.rt66.com/~shera, or you
can snitch it (and the associated SAhelp file) off the website and run it
off-line on your own computer using your browser. It should run under
any operating system that has a fairly modern browser. For the curious, I
have attached the html help file to this message.

Some of Survey Assistant's features are available in expensive software
packages, but I haven't seen any such package that is platform
independent or FREE.

Comments welcome. Brooks
[Attachment: SAhelp.htm; text/html; 5,057 bytes]

31. [tacgps] Re: tacgps digest: May 22, 2000

From: Scott Tillman <dpseng@primenet.com>
Date: Thu, 20 Jul 2000 15:16:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97675-2000.07.20-17.21.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> TAPR Special Interest Group Digest for Monday, May 22, 2000.
>
> 1.
> 2. DGPS accuracy
> 3. RE: DGPS accuracy
> 4. Re: DGPS accuracy
> 5.
>
> Subject: DGPS accuracy
> From: Scott Tillman <dpseng@primenet.com>
> Date: Mon, 22 May 2000 11:00:47 -0700
> X-Message-Number: 2
>
> So we all know that the accuracy of the basic GPS receiver
> has improved since SA has been turned off, but has that
> effected the results of a differential corrected receiver??
>
> scott   k7ysv@iname.com
>
> ------------------------------------
>
> Subject: RE: DGPS accuracy
> From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
> Date: Mon, 22 May 2000 13:05:45 -0500
> X-Message-Number: 3
>
>
> I have two Oncore VPs and a M12. When the VP generates DGPS, the other VP
> tracks it very tightly, usually within a meter over 15 minutes.
>
> ------------------------------------
>
> Subject: Re: DGPS accuracy
> From: Gerry Creager <gerry@cs.tamu.edu>
> Date: Mon, 22 May 2000 14:35:35 -0500
> X-Message-Number: 4
>
>
> Little. There's going to be some improvement because clocks are
> nominally better (unless you're using an M12 ;-) but most of the error
> introduced by SA was eliminated by DGPS.
>
> Gerry
>
>------------------------------------

> Subject: DGPS accuracy

  OK, now that we have had more time without SA, My
question is still; how
  does "bare" GPS compare to DGPS.   The old statement was
DGPS got you under
  5 meter error.   That's on the order of "bare" GPS now,
does DGPS now get us
  1 meter results like Brian is seeing or do not get any
significant improvement
  like Gerry suggests. JUst what if anything does DGPS
correct now???

Scott   K7YSV

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

32. [tacgps] Re: tacgps digest: May 22, 2000

From: "Jim King" <jim@jimking.net>
Date: Thu, 20 Jul 2000 17:28:01 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-97678-2000.07.20-17.32.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> OK, now that we have had more time without SA, My
> question is still; how
> does "bare" GPS compare to DGPS. The old statement was
> DGPS got you under
> 5 meter error. That's on the order of "bare" GPS now,
> does DGPS now get us
> 1 meter results like Brian is seeing or do not get any
> significant improvement
> like Gerry suggests. JUst what if anything does DGPS
> correct now???
>
> Scott K7YSV

My guess is that it depends on the receiver. I've seen reports of Oncore VP's with DGPS getting 1 meter accuracy, but Garmin handhelds (III+, I think) with DGPS only getting 5 meter accuracy. I think that lack of SA helps show differences in receiver accuracy that weren't apparent before.

Jim

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: tacgps digest: May 22, 2000

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 20 Jul 2000 20:33:54 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97696-2000.07.20-20.39.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim King wrote:
>
> > OK, now that we have had more time without SA, My
> > question is still; how
> > does "bare" GPS compare to DGPS. The old statement was
> > DGPS got you under
> > 5 meter error. That's on the order of "bare" GPS now,
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> > 1 meter results like Brian is seeing or do not get any
> > significant improvement
> > like Gerry suggests. JUst what if anything does DGPS
> > correct now???
> >
> > Scott K7YSV
>
> My guess is that it depends on the receiver. I've seen reports of Oncore
> VP's with DGPS getting 1 meter accuracy, but Garmin handhelds (III+, I
> think) with DGPS only getting 5 meter accuracy. I think that lack of SA
> helps show differences in receiver accuracy that weren't apparent before.

My experience with SA on, but in the period after Gore discovered GPS was that error ranged, generally between 30 and 50m, with periodic excursions to 95-100m, and inwards to 10m for generally short periods. Post SA, I've not had as much time to form a scientific opinion, but my initial impressions place the accuracy in the range of 6-10m (all of these are 2-sigma CEP...) with excursions to about 15m mostly associated with bad geometry and as little as 2-3m, associated with magic and luck.

My experience with DGPS w/SA was solid and reproducible enough to state that I tended to see a 1 order of magnitude improvement (60m --> 6m, etc) with DGPS within about 60 km (rover to base) and some degradation outward from there. I've done little enough code-phase work since SA went off, but I see no reason why the improvement shouldn't be similar: 10x or so... But when you couple that with the marked improvement in autonomous accuracy now that SA's off, that means you're starting with 10m, a 10x improvement places gives you something on the order of 1m with DGPS.

I'm trying to get a new Javad system up and running for dual freq work, but once it's up I'll have a base station for code and carrier phase corrections and can do some more looking at this.

73, gerry n5jxs
--

```
Gerry Creager           gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering                     |Research focusing on
Computer Science Department             |Satellite Geodesy and
Texas A&M University                    |Geodetic Control
979.458.4020  (Phone) -- 979.847.8578  (Fax)

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

34. [tacgps] Re: GPS Surveying Asst't Software

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 21 Jul 2000 07:32:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97772-2000.07.21-07.37.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks Shera wrote:

> I have written some JavaScript/HTML software that is handy for relating
> GPS position measurements (WGS-84) to local surveying coordinates, and
> has several other useful features of possible interest to tacgps folks.
>
> Briefly, given accurate GPS coordinates (latitude, longitude) for a pair
> of points that can be located on a local survey plat, this program
> computes the angular offset and distance scaling needed to transfer GPS
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> locations on the survey plat can be computed. This information allows
> surveyed locations to be accurately located on the ground using a GPS
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>
> For people not interested in surveying, the program can do some other
> potentially useful calculations. For example, given GPS coordinates and
> heights of two locations, the program can compute the bearing, distance,
> and elevation (above the horizon) of the line-on-sight path between them.
> This latter feature is rarely seen in navigation programs, which
> typically assume both stations are at sea level. It is useful for those
> who seek to identify distant mountains by their bearing and angle above
> the horizon, since it can also solve the inverse problem (given a bearing
> & distance it will compute a position). It is also useful for estimating
> line-of-site radio paths between two locations. To account for
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> line-of-sight calculation by 16.2% for optical and 33.3% for radio
> frequencies. But that's getting into the details.
>
> The software can used on-line on my website www.rt66.com/~shera, or you
> can snitch it (and the associated SAhelp file) off the website and run it
> off-line on your own computer using your browser. It should run under
> any operating system that has a fairly modern browser. For the curious, I
> have attached the html help file to this message.
>
> Some of Survey Assistant's features are available in expensive software
> packages, but I haven't seen any such package that is platform
> independent or FREE.

I'm currently too coffee-deficient to try it at this instant, but I'll
look later today...assuming my real job doesn't get in the way... and
I'll point one of our professors who teaches surveying at it, or one of
his grad students. Thanks for the note and the effort!

73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Research focusing on
Computer Science Department |Satellite Geodesy and
Texas A&M University |Geodetic Control
979.458.4020 (Phone) -- 979.847.8578 (Fax)

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35. [tacgps] Re: tacgps digest: May 22, 2000

From: "Steven R. Bible" <steveb@dandin.com>
Date: Fri, 21 Jul 2000 09:48:36 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-97785-2000.07.21-08.53.36--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

> OK, now that we have had more time without SA, My
> question is still; how
> does "bare" GPS compare to DGPS. The old statement was
> DGPS got you under
> 5 meter error. That's on the order of "bare" GPS now,
> does DGPS now get us
> 1 meter results like Brian is seeing or do not get any
> significant improvement
> like Gerry suggests. JUst what if anything does DGPS
> correct now???
>
> Scott K7YSV

Don't forget that DGPS reference stations also provide you with integrity of the GPS signal. This is one of the great intangibles. That reference stations are monitoring the GPS signals and sending corrections to the remote GPS units gives the remotes another vote from the reference stations.

In the event that a GPS satellite goes awry, the remote GPS is not alone in determining its position. Together with DGPS corrections can determine if the satellite data is good or not. In the past, there have been many a lone GPS receiver lock-up or give an incorrect position when a satellite was not operating properly. This is mostly the GPS receivers fault and many of the manufactures are better at this now.

Also, in the U.S. Coast Guard DGPS System, they employ monitoring stations of the reference stations. If a reference station goes awry, the backup reference station comes online and a status message (Type 16 I think?) is set out. If your DGPS receiver is so equipped, it can print out the status messages.

- Steve, N7HPR
n7hpr@tapr.org

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36. [tacgps] Re: tacgps digest: May 22, 2000

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 24 Jul 2000 06:49:29 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98179-2000.07.24-06.57.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Now that its summer, the only DGPS I can run, is if I generate it (I am 129 miles from the nearest DGPS beacon, its too noisy in the summer). Using a Oncore VP and sending corrections out once a second, a Oncore tracks it very tight. When I send it to a Garmin 12XL, I noticed the EPE jumps from 12-16 to somewhere in the 24-30 foot range. Dr. Clark informed that was due to generating 8 channels of DGPS reference vs 12 channels needed.

>From what I have seen, DGPS is not needed unless you need a reference for post processing. I have logged the Oncores for 2 weeks at a clip and the average position is in a 12 ft circuit. I have not logged a Garmin, but I use one every day and it takes me to the same place every day.

> ----------
> From: Gerry Creager N5JXS[SMTP:gerry@cs.tamu.edu]
> Reply To: TAPR Special Interest Group
> Sent: Thursday, July 20, 2000 8:33 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: tacgps digest: May 22, 2000
>
> Jim King wrote:
> >
> > > OK, now that we have had more time without SA, My
> > > question is still; how
> > > does "bare" GPS compare to DGPS. The old statement was
> > > DGPS got you under
> > > 5 meter error. That's on the order of "bare" GPS now,
> > > does DGPS now get us
> > > 1 meter results like Brian is seeing or do not get any
> > > significant improvement
> > > like Gerry suggests. JUst what if anything does DGPS

> > > correct now???
> > >
> > > Scott   K7YSV
> > >
> > My guess is that it depends on the receiver. I've seen reports of
> Oncore
> > VP's with DGPS getting 1 meter accuracy, but Garmin handhelds (III+, I
> > think) with DGPS only getting 5 meter accuracy. I think that lack of SA
> > helps show differences in receiver accuracy that weren't apparent
> before.
>
> My experience with SA on, but in the period after Gore discovered GPS
> was that error ranged, generally between 30 and 50m, with periodic
> excursions to 95-100m, and inwards to 10m for generally short periods.
> Post SA, I've not had as much time to form a scientific opinion, but my
> initial impressions place the accuracy in the range of 6-10m (all of
> these are 2-sigma CEP...) with excursions to about 15m mostly associated
> with bad geometry and as little as 2-3m, associated with magic and luck.
>
> My experience with DGPS w/SA was solid and reproducible enough to state
> that I tended to see a 1 order of magnitude improvement (60m --> 6m,
> etc) with DGPS within about 60 km (rover to base) and some degradation
> outward from there. I've done little enough code-phase work since SA
> went off, but I see no reason why the improvement shouldn't be similar:
> 10x or so... But when you couple that with the marked improvement in
> autonomous accuracy now that SA's off, that means you're starting with
> 10m, a 10x improvement places gives you something on the order of 1m
> with DGPS.
>
> I'm trying to get a new Javad system up and running for dual freq work,
> but once it's up I'll have a base station for code and carrier phase
> corrections and can do some more looking at this.
>
> 73, gerry n5jxs
> --
> Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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> Computer Science Department |Satellite Geodesy and
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>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

37. [tacgps] Antenna Testing - Phase Center

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 24 Jul 2000 7:3:55
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98180-2000.07.24-07.09.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

How can one check phase center on a antenna?

I have 3 Oncores, 2 portable antennas, and one permanent base antenna.

By running all the GPS off of the base antenna, I can see the difference of
the individual gps. This position is not surveyed.

Down the road, I have two NGS benchmarks about a mile apart. I thought
about setting up an antenna at each benchmark and rotating all three GPS
thru a test, recording two at a time (combination would be six test) and
then post processing the data.

Will this type of test give me the data I am looking for ?

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38. [tacgps] Re: tacgps digest: May 22, 2000

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 24 Jul 2000 08:17:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98194-2000.07.24-08.23.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> "Kirby, Brian" wrote:
>
> Now that its summer, the only DGPS I can run, is if I generate it (I
> am 129 miles from the nearest DGPS beacon, its too noisy in the
> summer). Using a Oncore VP and sending corrections out once a second,
> a Oncore tracks it very tight. When I send it to a Garmin 12XL, I
> noticed the EPE jumps from 12-16 to somewhere in the 24-30 foot
> range. Dr. Clark informed that was due to generating 8 channels of
> DGPS reference vs 12 channels needed.

If the Garmin is not using the same satellites in its position
determination that are being reported by the DGPS station, there will
not be a demonstrable improvement. It's been my experience that,
really, you have 7-9 satellites in your sky most of the time, with
periodic dips to 3-4 (rarely 3...) and occasional peaks to as many as 13
(I've seen that exactly once). Thus, an 8 channel DGPS generator should
be adequate. Most of the time. If some of your pseudoranges are
corrected and some not, then your position may well vary from truth.
Thus, it's always better to have a DGPS receiver capable of
"all-in-view" generation, but again, 8 channels is usually enough.

I've not gotten enough solid information to be certain, but have been
told by reliable sources that the EPE Garmin generates is not
necessarily gospel. From my perspective, the only way to determine
error is to compare it to a well-surveyed point and go on from there.

> From what I have seen, DGPS is not needed unless you need a reference
> for post processing. I have logged the Oncores for 2 weeks at a clip
> and the average position is in a 12 ft circuit. I have not logged a
> Garmin, but I use one every day and it takes me to the same place
> every day.

Depends on what you need and are using it for. If you're doing
high-precision GIS work, it's nice to gleen the extra meter or 2 out of
the solution. If you're doing surveying, it's mandatory. If you're
trying to find one parking space in in the parking lot at the HOSC,
you'd better use it. If you're only trying to find the parking lot...
or even a region therein that's fairly large, DGPS isn't needed.

I also suspect (and remember? from here?) that the Garmin receivers are
a bit noisier than the OnCores. That'll contribute to your error budget
as well.
73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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39. [tacgps] Re: Antenna Testing - Phase Center

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 24 Jul 2000 08:23:22 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98197-2000.07.24-08.29.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> How can one check phase center on a antenna?
>
> I have 3 Oncores, 2 portable antennas, and one permanent base antenna.
>
> By running all the GPS off of the base antenna, I can see the difference of
> the individual gps. This position is not surveyed.
>
> Down the road, I have two NGS benchmarks about a mile apart. I thought
> about setting up an antenna at each benchmark and rotating all three GPS
> thru a test, recording two at a time (combination would be six test) and
> then post processing the data.
>
> Will this type of test give me the data I am looking for ?

Gerry Mader at NGS does this as someth9ing between a living and a
religion. Check out the antenna pages under research at

http://www.grdl.noaa.gov/GRD/GPS/Projects/ANTCAL/
to see what he has for results.

In general, one test antenna is compared to a "gold standard" antenna.
Survey grade measurements are made and the results lead to determination
of phase center. It's not going to be necessarily easy using NGS
monuments, as you need stable platforms for the work. If you'd like to
discuss this more, let's do it off-line, unless there's sig-level
interest for a tutorial on this...

73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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40. [tacgps] Re: Antenna Testing - Phase Center

From: barnie@flash.net
Date: Mon, 24 Jul 2000 09:12:03 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98213-2000.07.24-09.17.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry:
I think there may be general interest in this topic. I am
interested for one. If there is too much text for the
group, perhaps you could point us to web references or put
the text at an FTP site.

Regarding the phase center, would not the NGS method actually
only give the delta between the phase center of the golden
antenna and the antenna under test? I was under the impression
that the only absolute antenna cal required an anechoic chamber
and GPS simulator hardware. Of course, given the "golden" antenna
phase center is no doubt known to high precision, the end result
is the phase center of the unknown antenna becomes known. The
problem from my perspective is the experiment is difficult for
anyone else to reproduce.

Jeff Vollin
KC6WFU

On Mon Jul 24 08:23:22 2000, "TAPR Special Interest Group"
<tacgps@lists.tapr.org> wrote:

> Brian Kirby wrote:
> >
> > How can one check phase center on a antenna?
> >
> > I have 3 Oncores, 2 portable antennas, and one permanent base antenna.
> >
> > By running all the GPS off of the base antenna, I can see the difference of
> > the individual gps. This position is not surveyed.
> >
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>
> In general, one test antenna is compared to a "gold standard" antenna.
> Survey grade measurements are made and the results lead to determination
> of phase center. It's not going to be necessarily easy using NGS
> monuments, as you need stable platforms for the work. If you'd like to
> discuss this more, let's do it off-line, unless there's sig-level
> interest for a tutorial on this...
>

> 73, gerry
> --
> Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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41. [tacgps] Re: tacgps digest: May 22, 2000

From: barnie@flash.net
Date: Mon, 24 Jul 2000 09:20:28 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98217-2000.07.24-09.25.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>From my observations, there may be one additional reason to
still use differential. I have seen the SPS data and DGPS
data give nearly the same RMS error, when measured over a
couple week timespan. However, the SPS data has some nasty
long-term correlation to it which means averages do not settle
down. DGPS on the other hand has errors that are more like
white (well, really pink) noise and hence they average out
rather well. So, if you want position determined to less than
1 meter, and you do not want to go to carrier phase techniques,
the best way is averaging DGPS. Of course, below 1 m, you will
have to be very careful about the datum.

Jeff Vollin
KC6WFU

On Mon Jul 24 08:17:18 2000, "TAPR Special Interest Group"
<tacgps@lists.tapr.org> wrote:

> > "Kirby, Brian" wrote:
> >
> > Now that its summer, the only DGPS I can run, is if I generate it (I
> > am 129 miles from the nearest DGPS beacon, its too noisy in the
> > summer). Using a Oncore VP and sending corrections out once a second,
> > a Oncore tracks it very tight. When I send it to a Garmin 12XL, I
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> > DGPS reference vs 12 channels needed.
>
> If the Garmin is not using the same satellites in its position
> determination that are being reported by the DGPS station, there will
> not be a demonstrable improvement. It's been my experience that,
> really, you have 7-9 satellites in your sky most of the time, with
> periodic dips to 3-4 (rarely 3...) and occasional peaks to as many as 13
> (I've seen that exactly once).   Thus, an 8 channel DGPS generator should
> be adequate. Most of the time.   If some of your pseudoranges are
> corrected and some not, then your position may well vary from truth.
> Thus, it's always better to have a DGPS receiver capable of
> "all-in-view" generation, but again, 8 channels is usually enough.
>
> I've not gotten enough solid information to be certain, but have been
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> > every day.
>
> Depends on what you need and are using it for.   If you're doing
> high-precision GIS work, it's nice to gleen the extra meter or 2 out of
> the solution. If you're doing surveying, it's mandatory. If you're

> trying to find one parking space in in the parking lot at the HOSC,
> you'd better use it. If you're only trying to find the parking lot...
> or even a region therein that's fairly large, DGPS isn't needed.
>
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> a bit noisier than the OnCores. That'll contribute to your error budget
> as well.
> 73, gerry
> --
> Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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>
> ---
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>

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42. [tacgps] Re: Antenna Testing - Phase Center

From: "Bruce Block" <bpblock@umich.edu>
Date: Mon, 24 Jul 2000 10:18:40
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98226-2000.07.24-10.23.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I would be interested in more information in this
area. A related topic is how well does an inexpensive
antenna, e.g. Tri-M Skymaster on a ground plane, compare
with an expensive "survey grade" Dorne-Margolin on a choke-
ring ground plane with respect to multipath rejection.
Actual measurements from a facility like NGS's would be very
interesting.

73, Bruce W8XN

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43. [tacgps] Re: Antenna Testing - Phase Center

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 24 Jul 2000 10:34:37 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98227-2000.07.24-10.42.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I can say this much, a choke ring helps. I ran the Motorola Antenna 97 on
ground planes and homemade choke rings. I noticed less extorsion with the
choke ring. The choke ring is basically 2 inch deep baking pans, and uses
4, 6, 8, 10, and 12 inch diameter pans.

> ----------
> From: Bruce Block[SMTP:bpblock@umich.edu]
> Reply To: TAPR Special Interest Group
> Sent: Monday, July 24, 2000 5:18 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Antenna Testing - Phase Center
>
> I would be interested in more information in this
> area. A related topic is how well does an inexpensive
> antenna, e.g. Tri-M Skymaster on a ground plane, compare
> with an expensive "survey grade" Dorne-Margolin on a choke-
> ring ground plane with respect to multipath rejection.
> Actual measurements from a facility like NGS's would be very
> interesting.
>
> 73, Bruce W8XN
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

>

44. [tacgps] Re: Antenna Testing - Phase Center

From: Bruce Block <bpblock@umich.edu>
Date: 24 Jul 2000 11:52:22 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98238-2000.07.24-10.55.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian,

Thanks for the info. I have been thinking of machining up a choke-
ring ground plane like those from Trimble or Ashtech; the NGS site
has a good list of dimensions, but your baking pan approach sounds
easier. Of course the related question is how much does the
antenna itself matter. I think you pay a lot for low-angle pattern
dropoff, but maybe not. Know of any place to get a DM C146 cheap?

73, Bruce

On 7/24/00, Kirby, Brian <Brian.Kirby@MSFC.NASA.GOV> wrote:
>RE: [tacgps] Re: Antenna Testing - Phase Center
>I can say this much, a choke ring helps. I ran the Motorola Antenna
>97 on ground planes and homemade choke rings. I noticed less extorsion
>with the choke ring. The choke ring is basically 2 inch deep baking
>pans, and uses 4, 6, 8, 10, and 12 inch diameter pans.
>----------
>From: Bruce Block[SMTP:bpblock@umich.edu]
>Reply To: TAPR Special Interest Group
>Sent: Monday, July 24, 2000 5:18 AM
>To: TAPR Special Interest Group
>Subject: [tacgps] Re: Antenna Testing - Phase Center
>I would be interested in more information in this
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>Actual measurements from a facility like NGS's would be very
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>73, Bruce W8XN
>---
>You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
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---
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45. [tacgps] Re: Antenna Testing - Phase Center

From: Brooks Shera <ebs@lanl.gov>
Date: Mon, 24 Jul 2000 10:49:47 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98243-2000.07.24-11.50.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My experience is the opposite. For me, an Antenna 97 on a baking pan
choke ring (a la Clark) and on flat ground plane performed qualitatively
the same. The multipath was estimated by comparing double-differenced
code phases with double-differenced carrier phases for the same pair of
sats over a period of time.

It would be interesting to see an evaluation of the baking pan choke ring
by folks with the equipment to do it right. Also, I haven't found a
reference that discusses the effectivenes of the fancy machined JPL-type
(?) choke rings. Perhaps someone knows of one.

Brooks

>I can say this much, a choke ring helps. I ran the Motorola Antenna 97 on
>ground planes and homemade choke rings. I noticed less extorsion with the
>choke ring. The choke ring is basically 2 inch deep baking pans, and uses
>4, 6, 8, 10, and 12 inch diameter pans.
>
>> ----------
>> From: Bruce Block[SMTP:bpblock@umich.edu]
>> Reply To: TAPR Special Interest Group
>> Sent: Monday, July 24, 2000 5:18 AM
>> To: TAPR Special Interest Group

>> Subject: [tacgps] Re: Antenna Testing - Phase Center
>>
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>> area. A related topic is how well does an inexpensive
>> antenna, e.g. Tri-M Skymaster on a ground plane, compare
>> with an expensive "survey grade" Dorne-Margolin on a choke-
>> ring ground plane with respect to multipath rejection.
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>> 73, Bruce W8XN

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46. [tacgps] Re: Antenna Testing - Phase Center

From: Boyd Prestwood K5YKG <k5ykg@bellatlantic.net>
Date: Mon, 24 Jul 2000 12:49:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98245-2000.07.24-11.54.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager N5JXS wrote:
>
> Brian Kirby wrote:
> >
> > How can one check phase center on a antenna?

> If you'd like to
> discuss this more, let's do it off-line, unless there's sig-level
> interest for a tutorial on this...
>
> 73, gerry

I'd like to monitor the discussion on this. It seems to be highly and
appropriately on-topic for this SIG. Please keep it here if you can.

Thanks es 73 de Boyd K5YKG
Southern New Jersey for now.

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47. [tacgps] Re: Antenna Testing - Phase Center

From: Gerry Creager <gerry@cs.tamu.edu>
Date: Mon, 24 Jul 2000 13:51:53 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98262-2000.07.24-13.57.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

barnie@flash.net wrote:
>
> Gerry:
> I think there may be general interest in this topic. I am
> interested for one. If there is too much text for the
> group, perhaps you could point us to web references or put
> the text at an FTP site.
>
> Regarding the phase center, would not the NGS method actually
> only give the delta between the phase center of the golden
> antenna and the antenna under test? I was under the impression
> that the only absolute antenna cal required an anechoic chamber
> and GPS simulator hardware. Of course, given the "golden" antenna
> phase center is no doubt known to high precision, the end result
> is the phase center of the unknown antenna becomes known. The
> problem from my perspective is the experiment is difficult for
> anyone else to reproduce.

Let me generate some comments and run 'em by Dr. Mader, then I'l release
them.

Couple of days, in my spare time, while I'm travelling;-)

Gerry
--

```
Gerry Creager                       |      Never ascribe to Malice that
Computer Science Department         |      which can adequately be
Texas A&M University                |      explained by Stupidity.
979.458.4020  (Phone)               |      -- Lazerus Long
979.847.8578  (Fax)

---
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```

48. [tacgps] Re: Re: Antenna Testing - Phase Center

From: W4OQM@aol.com
Date: Mon, 24 Jul 2000 21:53:30 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98313-2000.07.24-20.58.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In a message dated 7/24/2000 6:27:33 AM, you wrote:

>If you'd like to discuss this more, let's do it off-line, unless there's
sig-level
>interest for a tutorial on this...
>

Keep this discussion on line. I'm interested.

Charlie -- W4OQM
c.wells@ieee.org

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49. [tacgps] Re: Longitude Reminder

From: Henry Lesovsky <lexmd@earthlink.net>
Date: Tue, 25 Jul 2000 00:23:40 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98360-2000.07.25-02.25.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

FWIW Pete, I ordered the Longitude DVD. A&E's
"Electronic Shopping Cart" adds tax on shipping.
The printed invoice lists shipping separately. California
Tax Code specifies that no sales tax shall be collected
on shipping when the shipping charges are separately
stated. Presently, I am in a shouting match with A&E
on the issue.
Les Lesovsky in Alhambra, CA

Pete Prossen wrote:

> I taped Longitude for rescheduled viewing rather than try to stay on the
> couch for 4 hours.
>
> But it is so heavily polluted with commercials that the continuity of this
> great story is lost. And I know this will get worse further in to the
> story.
>
> The DVD is available, delivered and with tax, for $49.46. But that's beyond
> my threshold of price resistance to watch even this fine presentation.
>
> Is there anyone in the North San Diego County area that would like to share
> ownership with me?
>
> Pete Prossen
> WA6ZUH
> prossen@znet.com
>
> ---
> You are currently subscribed to tacgps as: lexmd@earthlink.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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50. [tacgps] Re: Longitude Reminder

From: Henry Lesovsky <lexmd@earthlink.net>
Date: Tue, 25 Jul 2000 00:37:46 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98361-2000.07.25-02.43.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Ira A. Wilner wrote:
snip

> Weren't early ships clocks wall mounted devices,

No, none were and still aren't stationary. They are
portable so that they can be calibrated off the ship.
Specifically, Harrison's H4 was a large precison
watch made to his specs by John Arnold. Harrison
had Arnold make the watch as a portable precision
timepiece to carry about for calibrating his clocks!
The design was so perfect that it became the proto
type for other than Harrison. Yes there is/was an
H5 but thought to never have been completed.
Les Lesovsky in Alhambra, CA

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51. [tacgps] Re: Longitude Reminder

From: "Pete Prossen" <prossen@znet.com>
Date: Tue, 25 Jul 2000 09:21:35 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98429-2000.07.25-11.26.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the tip, Les. I will order it by telephone so I can start my
argument before I give them my credit card number.

Regards

Pete Prossen
prossen@znet.com

----- Original Message -----
From: Henry Lesovsky <lexmd@earthlink.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Tuesday, July 25, 2000 12:23 AM
Subject: [tacgps] Re: Longitude Reminder

> FWIW Pete, I ordered the Longitude DVD. A&E's
> "Electronic Shopping Cart" adds tax on shipping.
> The printed invoice lists shipping separately. California
> Tax Code specifies that no sales tax shall be collected
> on shipping when the shipping charges are separately
> stated. Presently, I am in a shouting match with A&E
> on the issue.
> Les Lesovsky in Alhambra, CA
>
> Pete Prossen wrote:
>
> > I taped Longitude for rescheduled viewing rather than try to stay on the
> > couch for 4 hours.
> >
> > But it is so heavily polluted with commercials that the continuity of
this
> > great story is lost. And I know this will get worse further in to the
> > story.
> >
> > The DVD is available, delivered and with tax, for $49.46. But that's
beyond
> > my threshold of price resistance to watch even this fine presentation.
> >
> > Is there anyone in the North San Diego County area that would like to
share
> > ownership with me?
> >
> > Pete Prossen

> > WA6ZUH
> > prossen@znet.com
> >
> > ---
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>
>
>
>
> ---
> You are currently subscribed to tacgps as: PROSSEN@ZNET.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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52. [tacgps] ARRL and TAPR 19th Annual Digital Communications Conference

From: "Steven R. Bible" <n7hpr@tapr.org>
Date: Tue, 25 Jul 2000 16:29:01 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98486-2000.07.25-15.34.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

ARRL and TAPR 19th Annual
Digital Communications Conference
September 22-24, 2000 - Orlando, Florida

For more information see: http://www.tapr.org/dcc

Information
Mark your calendar and start making plans to attend the year's premier event in digital communications. The 19th Annual ARRL and TAPR Digital Communications Conference will be held September 22-24, 2000, in Orlando, Florida - just minutes from the Orlando International Airport.

The ARRL and TAPR Digital Communications Conference is an international forum for radio amateurs in digital communications, networking, and related technologies to meet, publish their work, and present new ideas and techniques for discussion. Presenters and attendees will have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications. The Digital Communications Conference is not just for the digital expert, but also for digitally oriented amateurs of all levels of experience.

A Conference for the Beginner as well
The conference is not just for the digital expert. As in years past an entire session strand with beginning, intermediate, and advanced presentations on selected topics in digital communications will be offered. Some of the topics will include: APRS, Satellite Communications, TCP/IP, Digital Radio, Spread Spectrum and other introductory topics. Come to the conference and hear these topics presented by the experts!

Area Attractions
The Orlando Florida area is famous for its attractions and vacation spots. Disney World, Universal Studios, and Sea World (just to name a few) are within 15 minutes of the hotel. Shuttle service from the hotel will be available for a small fee. Cape Canaveral and Cocoa Beach are a 30 minute drive East of the hotel.

Symposia, Seminars and Banquet
Two symposia/seminars will be held which allow those with additional time and interest to make the most of the Conference. For those who may have interest in just one symposium or seminar, registration for the conference is not required to attend these activities. This allows maximum flexibility for those who may want to participate during the Digital Communications Conference, but do not have an entire weekend to devote to the event.

The Fourth APRS National Symposium will be held on Friday and will be moderated by Steve Dimse, K4HG (the developer of javAPRS). It will likely include many APRS software authors, such as Bob Bruninga, WB4APR (the father ofAPRS), Keith Sproul, WU2Z, Mark Sproul, KB2ICI

(the developers of MacAPRS and WinAPRS), Brent Hildebrand, KH2Z (the developer of APRSPLUS), Mike Musick, N0QBF (developer of PocketAPRS), and other nationally known APRS leaders. Join this group for the afternoon and evening for in-depth discussions and presentations on the current and future status of APRS. This is a unique opportunity to gain insight into this fast-growing digital aspect of amateur operations that combines computers, packet radio, and GPS (Global Positioning System).

On Saturday night the DCC Banquet will be held. A guest speaker will speak after the banquet and a prize drawing will top the evening. The Grand Prize is a Palm VII Personal Digital Assistant.

The Sunday morning seminar will be focused on PIC development, design, and programming. This five-and-a-half hour seminar will focus on the things you need to know now in order to understand and begin to participate in PIC development.

Co-Hosts
The 2000 ARRL and TAPR Digital Communications Conference local co-hosts will be Lake Monroe Amateur Radio Society (http://www.qsl.net/lmars/),Orange County ARES/RACES(http://evcom.net/~jvoisin/ares.htm), Seminole County ARES/RACES (http://wwww.geocities.com/capecanaveral/launchpad/4773), and Orlando Amateur Radio Club(http://www.oarc.org/).

International Co-Hosts PRUG (Packet Radio User Group of Japan) will be the International co-host for a third year running. PRUG will be hosting an informal social Friday evening before their seminar and symposium is held. Visit http://www.prug.or.jp for more information about PRUG.

Call for Papers
Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the Conference is not required for publication. Papers are due by August 7th, 2000, and should be submitted to

Maty Weinberg, ARRL
225 Main Street
Newington, CT 06111

or via the Internet to

   lweinberg@arrl.org

Information on paper submission guidelines are available on-line at

   http://www.tapr.org/dcc

Hotel
Conference presentations, meetings, and seminars will be held at the Orlando Airport Marriott. It is highly recommended that you book your room prior to arriving. A special DCC room rate of $89/single and $89/double per night has been blocked for 50 rooms and is available until September 1st, 2000. Once the 50 rooms have been reserved, room rates will increase. So be sure to book your rooms early! The hotel provides transportation to and from the Orlando International Airport. Please contact the hotel to arrange specific transportation needs.

Orlando Airport Marriott (conference hotel)
7499 Augusta Drive
Orlando, FL 32822
Phone 407-851-9000, Fax 407-857-6211
(http://marriotthotels.com/MCOAP/)

What you can expect at DCC 2000
- A full day of papers and breakouts for the beginner to the advanced
- Two seminars/symposiums
- The fifth annual Student Paper session.
- A banquet with Special Guest Speaker.
- Informal get-togethers throughout the weekend.
- TAPR Membership Meeting
- An event at which the most important new developments in amateur digital communications are announced.
- Digital 'movers and shakers' from all over the world in attendance.

There are few activities where your participation can be so much fun and important! What a great way to share and renew your enthusiasm for

digital amateur radio! A get-together with colleagues and bringing
each other up to date on your latest work -- all this, and more, for
an unforgettable weekend of amateur radio and digital communications.
We hope to see you at the ARRL and TAPR Digital Communications
Conference on September 22-24, 2000!

Full information on the conference and hotel information can be
obtained by contacting:

Tucson Amateur Packet Radio
Phone: (940) 383-0000.
Fax: (940) 566-2544
Email: tapr@tapr.org
Web: http://www.tapr.org

Registration Form
Contact the TAPR office by Phone 940-383-0000, Fax 940-566-2544, or
Internet: http://www.tapr.org and tapr@tapr.org to register or for
additional information.

Conference Registration includes: Conference Proceedings, Sessions,
Meetings, and Lunch on Saturday.

Mail completed registration form with check to:
TAPR
8987-309 E Tanque Verde Rd #3378
Tucson, AZ 85749-9399

Or check http://www.tapr.org/dcc for an on-line registration form.

A registration packet will be mailed in September upon receipt of
registration form and payment.

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53. [tacgps] Re: Antenna Testing - Phase Center

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Wed, 26 Jul 2000 02:07:30 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98523-2000.07.25-21.12.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In addition to Jerry Mader's work, you might be interested in looking at
some of the results that Bruce Schupler and I have produced over the past
ten+ years. Our approach has been to make "absolute" phase center
measurements using an anechoic chamber. You can see one of our recent
publications (presented at the Spring 99 AGU meeting) at

    ftp://tac.gsfc.nasa.gov/pub/agu-ant99.DOC

This includes some data on my original "pie-pan" choke ring prototype that
may be of interest.

In our most recent session I did perform a full set of pahse center
measurements on the Motorola ANT99 antenna (including one mounted in my new
"pie-pan" choke rings with one more ring than in the AGU paper) and a
couple of other low-cost antennas. Also included were several new geodetic
antennas, including all the Javads and Leicas.

Sorry that those results aren't ready to show yet -- We accumulated several
tens of gigabytes of data on 40+ antennas with full complex data taken
every [2 deg(elev)]*[5 deg (azimuth)]*[with / without radomes]*[up to 140
frequencies to get group delays over both GPS and GLONASS and the new L5
frequency]. It has been slow getting that multi-dimension mess untangled
(the data is intrinsically sorted in the worst possible order, and the
fellow who wrote the LabView data acquisition code for the range left!).

Just so you have a feeling about these measurements. For some years we have
used one standard antenna (the "zebra" in the AGU paper) and it has
repeated at the 1-2 mm level every time it is tested.

Hope this helps -- 73, Tom

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54. [tacgps] Re: Antenna Testing - Phase Center

From: "Bruce Block" <bpblock@umich.edu>
Date: Wed, 26 Jul 2000 14:23:59
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98625-2000.07.26-14.29.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dr. Clark:

Thanks for a very interesting set of measurements. Your "pie-pan"
design does very well indeed. One question occurs about construction
techniques, though, which is how well bonded (electrically) do the
rings need to be to the bottom plate. Do they need to be bonded
continuously about their bottom interface, or could it be done at a
number of points, e.g. soldering flex PCB to a PCB bottom plane? Or
bolting an aluminum or steel ring at points about its circumference?
This question doesn't arise for the "expensive" CRGPs since they are
probably machined from a solid billet of aluminum. Likewise, does the
thickness of the ring matter much? The original JPL design had
something like 1/8" thick rings, I think.

73, Bruce W8XN

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

55. [tacgps] Re: Antenna Testing - Phase Center

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 27 Jul 2000 04:55:01 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98716-2000.07.27-00.00.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bruce Block wrote:

> Thanks for a very interesting set of measurements. Your "pie-pan"
> design does very well indeed. One question occurs about construction
> techniques, though, which is how well bonded (electrically) do the
> rings need to be to the bottom plate. Do they need to be bonded
> continuously about their bottom interface, or could it be done at a
> number of points, e.g. soldering flex PCB to a PCB bottom plane? Or
> bolting an aluminum or steel ring at points about its circumference?
> This question doesn't arise for the "expensive" CRGPs since they are
> probably machined from a solid billet of aluminum. Likewise, does the
> thickness of the ring matter much? The original JPL design had
> something like 1/8" thick rings, I think.

Let me describe my choke-ring antenna. I have some photos on my other
FTP site, so please refer to the URL

        ftp://aleph.gsfc.nasa.gov/GPS/antennas/

Start with the photo parts.jpg -- The basic design has a Motorola ANT97
sitting on a 4" diameter center piece that is in reality a standard round
or octagonal outlet box. In the center you will see a hardware store 5/8-11
threaded insert, chosen because 5/8-11 is the thread associated with
standard surveying instruments.

The choke rings are 6", 8" & 10" in diameter, 2" deep. The depth wants to
be a quarter-wavelength, and in cross-section we make a shorted
quarter-wave transmission line, with the short on the "bottom". The actual
antenna I decided was the best used 2" deep galvanized steel air
conditioning duct caps from the local hardware store for the 6" and 8"
rings, and the outer 10" ring was a steel baking dish, coated with
something that may have been Teflon. Ignore the 8" and 10" baking pans in
the upper right corner.

Now go to the photo holes.jpg, which shows the next step of the assembly.
The center hole thru all the layers is 5/8" in diameter, done with an old
Greenlee punch that was used to punch sockets for 7-pin glow-FETs (i.e.
tubes) in the bygone days of yore. The smaller holes are all 1/8" in
diameter for pop rivets. The extra 5/8 hole allows the BNC coax connector
to get to the outside world. The photo choke_asm.jpg shows how the pieces
fit together.

The different layers need to have RF contact, but I still wanted the

antenna to be rust-proof. So all the galvanized sheet metal pieces were painted with zinc rust-proof paint. A layer or 2 was put on the pieces, then they were pop riveted together. I figured that there would be some ohmic contact, but the capacity of two layers of metal separated by paint was good enough. You can see the painted antenna all assembled sitting on my surveying tripod in the photo tripod.jpg. After that photo was taken, the entire antenna was put in a 12-13" air-tight plastic cake holder as a radome. I almost used Tupperware but found a better Rubbermaid product at the local supermarket.

So the cost of the parts for this antenna was ~$25 at the local hardware store, kitchen store, etc plus the Motorola patch antenna. The Motorola ANT97 is available from TAPR (http://www.tapr.org, $65 less member discount plus shipping) and from Rick (W2GPS, ex WB2TNL) (http://www.cnssys.com/Ordering.html, $49 plus shipping). So the whole project can be done for under $100.

In case you are interested, the choke_proto.jpg photo shows the earlier 8" prototype, which is the one that was measured on the range and reported in the paper I noted in my earlier message.

You asked about the JPL design -- it was done by Don Sptizmesser many years ago, but the design was adopted by the geodetic community. The rings are 2.50000" deep with a width of 1.00000" and a thickness of 0.1250000 inches. Obviously Don's original engineering was seat-of-the-pants.

You can see one of these geodetic antennas at my GODE IGS site near NASA/Goddard in the gode-ant.jpg photo. In the background you will see our 6M VLBI dish (originally mobile, now planted firmly) and the two trailers. My GPS hardware is in the near trailer, and the the other trailer houses the VLBI hardware and the Hydrogen Maser clock. This is where I have done most of the high-accuracy testing of various timing receivers. Atop the tower is a 2M antenna which was used for the original W3IWI-13 amateur DGPS work.

The 6_choke_ants.jpg photo is the same one as in the AGU paper. The "zebra" range calibration reference antenna in on the right-hand side with yellow & black stripes.

Finally, the two matjaz*.gif drawings are of Matjaz Vidmar's (S53MV)'s GPS quadrifilar helix made out of .141" coax and copper wire.

73, Tom

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56. [tacgps] Re: Antenna Testing - Phase Center

From: Brooks Shera <ebs@lanl.gov>
Date: Thu, 27 Jul 2000 22:06:08 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-98786-2000.07.27-10.11.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom

Do you have any data comparing the pie-pan choke ring performance to other simple things like (1) a simple metal ground plane or (2) an absorber (like you used to cover the "cement post" in the AGU article)?

I think many folks are interested in multipath reduction, more than angle-averaged phase center data. So parameters like LHP rejection and low-angle signal rejection would be of interest.

Brooks

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57. [tacgps] Re: Antenna Testing - Phase Center

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 31 Jul 2000 7:14:6
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-99568-2000.07.31-07.19.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For those of you who want to see my "choke ring" antennas, you can view them at http://fly.hiwaay.net/~kirbybq/gps .

They are 2 inch deep baking pans, using 4, 6, 8, 10, and 12 inch pans. I marked the center of the 6, 8, 10 and 12 inch pans and drilled a 1/4 inch hole in the center. I put a bolt in that hole and then drilled two more holes beside the center hole. I put bolts in the new holes and then removed the bolt in the center hole. I used the center hole to pass the antenna coax thru. I took the center 4 inch pan and marked the center of it and glued the Motorola Antenna97 to the pan with epoxy. I used a black epoxy so the UV would not break it down. I used 1 inch wide rubber bands to hold the antenna in place until the epoxy set. Then I made 1 inch wood block shims spacers and then glued the 4 inch pan to the choke ring again with epoxy and big rubber bands. I made three of these antennas. The unit that became my base station, I used stainless steel hardware, since it would be outside all of the time. The other two antenna, for portable use, I added a section of 3/4 inch square aluminum tubing about 8 inches long to the bottom, again with epoxy. I put the square tubing in a tripod leveling adapter made for laser levels, which provides the mount to the tripods. I have lines scored on the tubing mount, which I lined up with the tripod adapter.

Brooks mention that he did nothing special with his antenna's and he was seeing good data. I made some measurements this weekend. I put one antenna on a NGS benchmark about 2 miles from my house and then I put another unit on another NGS benchmark about 5 miles from the first bench mark. I let the units run for 4 hours and recorded carrier phase data at 1 second intervals. I post processed the data as static using float solutions and both benchmarks came up within 3 cm of the benchmarks. The only special attention was to align the tripods and antennas over the benchmarks. I must have spent about 10 minutes with plumb bobs, trying to get them dead on... My antennas "choke rings" cost under $30 at a bake shop. Not bad performance, considering the cost of each assembled antenna is under $100 each counting the Antenna97!

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August 2000

Original source file: tacgps.0008
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0008

1. [tacgps] M12 - DGPS

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Fri, 4 Aug 2000 9:19:40
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-100561-2000.08.04-09.25.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has anybody tried interfacing the M12 to the TAPR DGPS board ? I am
interested in trying it, but I know the pin outs/voltages are different.

Brian - KD4FMN

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2. [tacgps] Re: M12 - DGPS

From: "Doug McKinney" <Design@mt.to>
Date: Fri, 4 Aug 2000 08:35:22 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-100586-2000.08.04-10.47.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve Bible and I have been looking into this (we built the DGPS interface
board). Steve has my M12 for testing, so I can't respond as to the success.
We are not impressed with the M12's xtal, which causes poor timing stablity.
Also, with SA off, we don't have enough user input as to the need for better
than 10m accuracy. The original DGPS was significant in that the 100m
radius error was reduced to 5m radius! But sinse SA is off and we are
seeing 10m radius solutions, the value of DGPS to provide potential for 1m
accuracy, for HAM's, is really questionalbe and not economical to produce
and considering the M12 xtal problem, it may not be worth doing!!!

Doug KC3RL

----- Original Message -----
From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Friday, August 04, 2000 9:19 AM
Subject: [tacgps] M12 - DGPS

> Has anybody tried interfacing the M12 to the TAPR DGPS board ? I am
> interested in trying it, but I know the pin outs/voltages are different.
>
> Brian - KD4FMN
>
> ---
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3. [tacgps] Re: M12 - DGPS

From: "Lyle Johnson" <wa7gxd@hotmail.com>
Date: Fri, 04 Aug 2000 10:50:39 MST
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-100617-2000.08.04-12.56.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug,

>We are not impressed with the M12's xtal, which causes poor timing
>stablity.
>Also, with SA off, we don't have enough user input as to the need for
>better
>than 10m accuracy.

I'd like to use DGPS anyway. 10m is OK for some things, 2-5 m is better :-)

And who knows when SA may be turned on again (it is a policy issue, and
we're going to change the guy who sits in the chair and makes this stuff up
come January)?

73,

Lyle

PS - anyone on this list know if the new Kenwood TH-D7A handheld will now
act as a DGPS reference station? The earlier version of firmware did NOT
support transparent mode in the TNC, and when I ask Kenwood they give me a
blank look. Thanks. LJ

_____
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---
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4. [tacgps] DGPS -- some things to think about

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Mon, 07 Aug 2000 17:17:42 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-101214-2000.08.07-12.23.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug McKinney wrote:
>
> Steve Bible and I have been looking into this (we built the DGPS interface
> board). Steve has my M12 for testing, so I can't respond as to the success.
> We are not impressed with the M12's xtal, which causes poor timing stablity.
> Also, with SA off, we don't have enough user input as to the need for better
> than 10m accuracy. The original DGPS was significant in that the 100m
> radius error was reduced to 5m radius! But sinse SA is off and we are
> seeing 10m radius solutions, the value of DGPS to provide potential for 1m
> accuracy, for HAM's, is really questionalbe and not economical to produce
> and considering the M12 xtal problem, it may not be worth doing!!!

My impression is not that the crystal is so bad, but that Motorola's
current 1.3 firmware is a GIANT! step backwards. As I understand it, the
M12 firmware is NOT! a direct port of the old ONCORE firmware onto the
MCORE chipset, but rather it is the product of a fresh effort. I believe
that the new MCORE/M12 firmware came out of Moto's Austin TX shop and
not
from the Phoenix group that had done the ONCORE. I have also heard hints
that some internal corporate dispute may exist between the divisions.
One
can hope that Motorola can resume their status as a quality receiver
manufacturer soon.

In the meantime, a few of us [especially Rick, W2GPS (ex WB2TNL) and me]
been working on a new alternative currently in the "alpha" release (i.e.
more than vaporware, but not yet yet for publick discussion) stages. It
is a 12-channel timing receiver that is already showing sub-nsec
short-term
noise, and with performance limited by the ionosphere and the UTC(GPS)
minus UTC(USNO) errors. This widget is also a 12-channel DGPS base
station.
I'm hoping we will be able to make some more definitive statement about
it at the Salt Lake ION meeting in Sept. when Rick & I are scheduled to
give a review paper on low-cost, high-accuracy timing activities.

The limitation on DGPS performance now (post-SA) tends to be in the user
receivers. One test I did with a Garmin GPSIII+ against the new "brand
X"
engine was severely limited by the fact that the lowest order digit
reported by the III+ in its NMEA message corresponded to ~2 meters,
making sub-meter DGPS performance be rather irrelevant. Nevertheless,
a statistical analysis of the results seemed to show that the Garmin
had ~1 meter intrinsic error in its geometric calculations. My gut
feeling was that the Garmin software people omitted some lower order
geometric and algorithmic effects (like some of the relativistic
corrections and the number of digits carried in calculations of
multiply,
divide, sine, cosine, etc) because they didn't intend for their unit to
be used at the sub-meter level!

73, Tom

of

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5. [tacgps] Re: DGPS -- some things to think about

From: Dr Thomas A Clark <clark@tomcat.gsfc.nasa.gov>
Date: Mon, 07 Aug 2000 17:23:10 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-101219-2000.08.07-12.29.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

By the way, if you want to try the "Brand-X" as an NTP time server,
try tomcat.ggao.nasa.gov. An ONCORE VP running from the same antenna
is on tac.ggao.nasa.gov -- both of these are running Rick's TAC32Plus
NTP on Windoze 2000. An ONCORE/TAC combination running under LINUX is
now available at gpstime.com

Tom

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6. [tacgps] ION-2000 talk abstracts online

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 15 Aug 2000 14:02:41 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-102891-2000.08.15-15.08.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Abstracts of the talks to be given at ION-2000 (Salt Lake City, Sept
19-22) are available online at www.ion.org. These include talks on
carrier-phase processing, freq/time standards, and other GPS-related
stuff of potential interest (including one by our own Tom C. and Rick as
was mentioned earlier)

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7. [tacgps] Real time clock

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sun, 20 Aug 2000 13:15:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103770-2000.08.20-12.21.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anyone know of a source for an inexpensive hardware (maybe even a kit)
RTC (real time clock) that can be driven by the 1 PPS pulses from the TAC-2?

Thanks, John W4SF

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8. [tacgps] Re: Real time clock

From: "Steve Sampson" <ssampson@usa-site.net>
Date: Sun, 20 Aug 2000 12:52:40 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103783-2000.08.20-12.59.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I think most people just use the NTP software to drive their timing.

One thing I thought would materialize was a stable LO (STALO)
using this. Something that could run at 800 MHz or so, and be
multiplied for a nice output on 2.4 GHz. Make a nice bi-static mode
device where everyone is on the same frequency at the same second...

----- Original Message -----

> Does anyone know of a source for an inexpensive hardware (maybe even a kit)
> RTC (real time clock) that can be driven by the 1 PPS pulses from the TAC-2?

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9. [tacgps] Real time clock

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sun, 20 Aug 2000 23:09:30 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103866-2000.08.20-22.15.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>Do you have a preference of large (wall mount) or small (desk top)?
>Analog or digital display? LED, LCD, VFD?

>I've seen some simple ones using a Basic Stamp uP and an LCD display.
>Let me know if you want me to dig further for the reference.

>/tvb

Tom --

I would prefer a desktop LED display with about 3/4-inch high characters
showing HH:MM:SS. However, LCD would be OK, depending on what is available.
What is VFD? I had not thought of an analog display, but it sounds
interesting. The main thing is being able to drive it with the 1 PPS pulses
from the TAC-2. Thanks for your help.

John

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10. [tacgps] Re: Real time clock

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 20 Aug 2000 22:19:48 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103867-2000.08.20-22.26.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This is a good place to start, only 0.56 high (close enough unless you are
going orbit or land on Mars) http://electronicsusa.com/ck1.html

Indicates that it is easily set to time standard.

G. Beat
w9gb

> Tom --
>
> I would prefer a desktop LED display with about 3/4-inch high characters
> showing HH:MM:SS.

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11. [tacgps] Re: Real time clock

From: "Steve Sampson" <ssampson@usa-site.net>
Date: Sun, 20 Aug 2000 23:19:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103874-2000.08.20-23.26.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Isn't that just a clock, rather than a "real time clock" ??

----- Original Message -----

> I would prefer a desktop LED display with about 3/4-inch high characters
> showing HH:MM:SS. However, LCD would be OK, depending on what is available.

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12. [tacgps] Re: Real time clock

From: Dave Martindale <davem@cs.ubc.ca>
Date: Sun, 20 Aug 2000 21:36:16 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103881-2000.08.20-23.43.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For someone who doesn't mind writing some PIC software, I have some code
that read the NMEA data stream from a GPS, selects certain sentences
from the data stream, extracts certain data fields from those sentences,
and displays the data on a standard character-mode LCD screen. To drive
an LED display instead, you'd need to add some code to multiplex the
display, but not much more - a relatively modest change.

The code is written for the PIC 16F84 processor, and is available free for
non-commercial use. You'd have to build your own hardware, but it would
be little more than a PIC, a ceramic resonator, a couple of transistors
for LED anode and cathode drive, and the LEDs themselves.

If you used the code as-is, you'd get a clock that always stays synchronized
to UTC, but is always a fraction of a second late due to the delay between
the actual beginning of each second and the first time the time appears in
the NMEA output. This could be fixed by feeding the 1PPS signal from the
TAC to an extra input on the PIC, and having a rising edge on 1 PPS increment
the displayed time instantly, before the new NMEA data arrives. This
would almost always display perfect time.

(The only time it would be wrong would be during a leap second. The code
wouldn't know a leap second is coming, so the 1 PPS at the beginning of
the leap second would cause 23:59:59 to erroneously change to 00:00:00.
Then the NMEA data would force the time to change back to 23:59:60 a
fraction of a second later. Not serious, I think).

        Dave

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13. [tacgps] Re: Real time clock

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 21 Aug 2000 06:31:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103927-2000.08.21-06.37.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dave Martindale wrote:
>
> For someone who doesn't mind writing some PIC software, I have some code
> that read the NMEA data stream from a GPS, selects certain sentences
> from the data stream, extracts certain data fields from those sentences,
> and displays the data on a standard character-mode LCD screen. To drive
> an LED display instead, you'd need to add some code to multiplex the
> display, but not much more - a relatively modest change.
>
> The code is written for the PIC 16F84 processor, and is available free for
> non-commercial use. You'd have to build your own hardware, but it would
> be little more than a PIC, a ceramic resonator, a couple of transistors
> for LED anode and cathode drive, and the LEDs themselves.
>
> If you used the code as-is, you'd get a clock that always stays synchronized
> to UTC, but is always a fraction of a second late due to the delay between
> the actual beginning of each second and the first time the time appears in
> the NMEA output. This could be fixed by feeding the 1PPS signal from the
> TAC to an extra input on the PIC, and having a rising edge on 1 PPS increment
> the displayed time instantly, before the new NMEA data arrives. This
> would almost always display perfect time.
>
> (The only time it would be wrong would be during a leap second. The code
> wouldn't know a leap second is coming, so the 1 PPS at the beginning of
> the leap second would cause 23:59:59 to erroneously change to 00:00:00.
> Then the NMEA data would force the time to change back to 23:59:60 a
> fraction of a second later. Not serious, I think).

Just free-forming here, and not criticizing, but a couple of thoughts...

1. Be prepared to add an inverter. Some receivers provide 1PPS as a
rising edge trigger, and some as a falling edge trigger. Know your
receiver.
2. If memory serves, one of the almanac messages in NMEA-0183 gives a
heads-up about leap-seconds.

73, gerry n5jxs
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Research focusing on
Computer Science Department |Satellite Geodesy and
Texas A&M University |Geodetic Control
979.458.4020 (Phone) -- 979.847.8578 (Fax)

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14. [tacgps] Real time clock

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Mon, 21 Aug 2000 09:53:19 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-103945-2000.08.21-08.59.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On August 20 Gregory Beat wrote --

>This is a good place to start, only 0.56 high (close enough unless you are
>going orbit or land on Mars) http://electronicsusa.com/ck1.html

>Indicates that it is easily set to time standard.

>G. Beat
>w9gb

Greg -- These clocks look real good - just about what I am looking for but
I'm not sure they can be modified to work with 1 PPS input.
Most clock chips work with 60 Hz input. I will e-mail the company and find
out.
Thanks for the input.

John W4SF

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15. [tacgps] Re: Real time clock

From: Dave Martindale <davem@cs.ubc.ca>
Date: Mon, 21 Aug 2000 11:03:39 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104021-2000.08.21-13.10.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>1. Be prepared to add an inverter. Some receivers provide 1PPS as a
>rising edge trigger, and some as a falling edge trigger. Know your
>receiver.

True, receivers differ. But I was under the impression that the TAC
kits had some sort of internal inverter so the 1 PPS output was always
positive-going. In any case, if you use a PIC, you can always change
the polarity you care about with a small edit to the software.

If you use a larger PIC with a proper serial port, the 1 PPS could be
connected to the RB0 interrupt input, and it can be programmed to
interrupt on either polarity of edge. In the case of my code, I use
a 16F84 which has no serial port, so I use RB0 to detect the serial
start bit. So you'd have to poll for the 1 PPS - not a big deal.

>2. If memory serves, one of the almanac messages in NMEA-0183 gives a
>heads-up about leap-seconds.

The receivers I'm familiar with don't produce almanac data at regular
intervals, they do it only on command. So the PIC would have to be
prepared to send a command to the NMEA input of the GPS receiver. This
is actually rather a pain on a PIC with no hardware serial ports, unless

you disable receiving temporarily while transmitting. A more capable
PIC with real USART hardware would make this much easier.

There is also the problem that GPS receiver serial port is usually connected
to a host computer. Tapping the GPS serial *output* and feeding it to the
PIC as well as the computer causes no problems if the PIC is a passive
listener. But if the PIC needs to send occasional commands to the GPS
serial *input*, you now have a problem of arbitration between the time
display and the computer - what happens if both send commands at the same
time? This can either be solved with diodes (simple, as long as you
don't mind the occasional garbled command) or by routing the two data
streams through something with some intelligence and buffering.

It's possible to do all this perfectly, but it's so much simpler if
you're prepared to tolerate an incorrect display for a fraction of a
second during the leap second that imperfection would be my choice.

        Dave

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16. [tacgps] Re: Real time clock

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Mon, 21 Aug 2000 22:07:19 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104118-2000.08.21-22.20.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John -

This solution is available as a kit (remember kit-bashing?) There is
another company that makes the digital clocks for radio/TV broadcasting, but
I have lost that web link.

First thing to ask them is: What off-the-shelf clock chip they are using ?

G. Beat
w9gb

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17. [tacgps] Re: tacgps digest: August 21, 2000

From: Derek Lassen <kn6td@clubnet.net>
Date: Tue, 22 Aug 2000 02:56:07 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104186-2000.08.22-05.03.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have for some time wanted a wall clock that was exactly on time. Just the
idea of it being correct. I know that there would be some ambiguity due to
perception and speed of propagating and so on, but these would be ok.

So what I would like is an existing clock kit which is run by a PIC, which
I could reprogram to accept time corrections from a serial port. And if
this kit had alarm functions - woo hoo! My lifestyle schedule (via MS
Schedule) could be propagated to my bedroom clock. It would be nice if my
wall clocks did a man-from-UNCLE kind of thing when I needed to check
incoming email or scheduled things. Your clock is not just for time anymore!

Anybody know of a clock kit carrying a PIC?

Thanks.

73 de KN6TD
(S) Derek

18. [tacgps] Real time clock

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Tue, 22 Aug 2000 11:05:23 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104224-2000.08.22-10.11.16--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

>This solution is available as a kit (remember kit-bashing?) There is
>another company that makes the digital clocks for radio/TV broadcasting,
but
>I have lost that web link.

>First thing to ask them is: What off-the-shelf clock chip they are using ?

Greg -- I contacted the people that make these clocks via e-mail and their
answer was that none of their clocks can be modified to accept a 1 PPS
input. They only will work with 60 Hz via the power line or the cheap
built-in 60 Hz time base. Guess that tells you something about the clock
chips they use. I think they (and others) are missing the boat. Certainly
there are others that would like to have a nice real time clock display
driven by their TAC-2s.

Different subject: There are some nice clocks at www.atomictime.com that use
built-in WWV (60 kHz) receivers to keep the clocks accurate. They have a
large variety of these clocks including watches and nice desktop and wall
clocks. This of course is not what I am looking for but I wonder if anyone
has had any experience with these timepieces and if they get good reception
at various geographical locations.

73   John

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] Re: Real time clock

From: Jack Warren <warren@mail-nh.eng.utr.ti.com>
Date: Tue, 22 Aug 2000 11:56:31 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: warren@rainier.eng.utr.ti.com
Message-ID: <LYR6754-104236-2000.08.22-11.04.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>
> Different subject: There are some nice clocks at www.atomictime.com that use
> built-in WWV (60 kHz) receivers to keep the clocks accurate. They have a
> large variety of these clocks including watches and nice desktop and wall
> clocks. This of course is not what I am looking for but I wonder if anyone
> has had any experience with these timepieces and if they get good reception
> at various geographical locations.
>
> 73   John

Hi all.

I bought a 60kHz RC movement from www.klockit.com more than a year ago
and used it to replace a movement in a wooded wall clock we have in our
kitchen. It doesn't keep the kind of time you folks are usually
talking about (1e-<big>), but it surely keeps good enough time such
that I can't see a difference between the time the second hand jumps
and the HF rig goes "tick" when listening to WWV.

I live in southern NH and have not had a problem with signal strength.
The clock is on an inside wall in the middle of the house.

I recently replaced the AA cell that lasted almost 1.5 years...

Regards,
Jack Warren
WB4MDC, FN42fv

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] Real time clock

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Tue, 22 Aug 2000 15:59:20 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-104292-2000.08.22-15.05.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I bought a 60kHz RC movement from www.klockit.com more than a year ago
>and used it to replace a movement in a wooded wall clock we have in our
>kitchen. It doesn't keep the kind of time you folks are usually
>talking about (1e-<big>), but it surely keeps good enough time such
>that I can't see a difference between the time the second hand jumps
>and the HF rig goes "tick" when listening to WWV.

>I live in southern NH and have not had a problem with signal strength.
>The clock is on an inside wall in the middle of the house.

>I recently replaced the AA cell that lasted almost 1.5 years...

>Regards,
>Jack Warren
>WB4MDC, FN42fv

Thanks for sharing the info Jack. The price is certainly right - complete
movement and WWV receiver for less than $25 - wow.

73   John

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Re: tacgps digest: August 21, 2000

From: "Robert E. Martinson" <remartin@tiac.net>
Date: Tue, 22 Aug 2000 23:25:48 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104399-2000.08.22-22.32.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I also want accurate time!

To keep my PC on-time I use the "Zeit Arcron" (www.atomictime.com)
"Zeit-PC". It has a disciplined oscillator and sinks-up with WWVB each day.
It has a serial port to interface with a PC. The PC can be set to the
clock's time as often as desired (or just on boot-up). Works very well.

They also have wall mounted WWVB clocks.

They are quite reasonable and often their ads in QST have cheaper prices
then you'll see on-line.

I have no connection with Zeit or AtomicTime, just a satisfied user. I also
have their digital watch, it too works great. I don't know how they can
build a 60KHz antenna into a wristwatch case?

Also see:

QUOTE

-----Original Message-----
From: Tom Kreyche [mailto:tkreyche@well.com]
Sent: Monday, June 05, 2000 11:14 AM
To: SeeSat-L@blackadder.lmsal.com
Subject: RE: Accurate Timings, clocks that sync to WWV

More than you ever wanted to know about clocks and watches with integrated
receivers to keep them automatically synched to WWV.

http://www.geocities.com/Hollywood/Cinema/1492/clocks/index.html
http://www.brgproducts.com

UNQUOTE

73,
Bob Martinson
N1VQR@amsat.org

-----Original Message-----
From: bounce-tacgps-5665@lists.tapr.org
[mailto:bounce-tacgps-5665@lists.tapr.org]On Behalf Of Derek Lassen
Sent: Tuesday, August 22, 2000 5:56 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: tacgps digest: August 21, 2000

I have for some time wanted a wall clock that was exactly on time. Just the idea of it being correct. I know that there would be some ambiguity due to perception and speed of propagating and so on, but these would be ok.

So what I would like is an existing clock kit which is run by a PIC, which I could reprogram to accept time corrections from a serial port. And if this kit had alarm functions - woo hoo! My lifestyle schedule (via MS Schedule) could be propagated to my bedroom clock. It would be nice if my wall clocks did a man-from-UNCLE kind of thing when I needed to check incoming email or scheduled things. Your clock is not just for time anymore!

Anybody know of a clock kit carrying a PIC?

Thanks.

73 de KN6TD
(S) Derek

22. [tacgps] RE: Real time clock

From: "Robert E. Martinson" <remartin@tiac.net>
Date: Tue, 22 Aug 2000 23:25:52 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104400-2000.08.22-22.32.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have one (the PC) version. It works very well, but does miss a day's update once and a while (no big deal, I believe it has a disciplined oscillator). Note: it appears to try it's first (of 4 tries) update at INDICATED midnight. So if I try to use it on UTC it's trying when my PC is usually on and is unable to sync (suspect too much hash from the PC, but maybe propagation isn't good enough at 2000-2400 hrs EDST.

Have not tried it away from home, but if it works in NE it will probably work anywhere in CONUS.

73,
Bob
N1VQR@amsat.org
FN42

<<<SNIP>>>

Different subject: There are some nice clocks at www.atomictime.com that use built-in WWV (60 kHz) receivers to keep the clocks accurate. They have a large variety of these clocks including watches and nice desktop and wall clocks. This of course is not what I am looking for but I wonder if anyone has had any experience with these timepieces and if they get good reception at various geographical locations.

73 John

<<<SNIP>>>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] Re: Real time clock

From: GS <gsanders1@bigfoot.com>
Date: Wed, 23 Aug 2000 00:33:42 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104408-2000.08.22-23.40.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"John K. Pringle" wrote:
>

> Different subject: There are some nice clocks at www.atomictime.com that use
> built-in WWV (60 kHz) receivers to keep the clocks accurate. They have a
> large variety of these clocks including watches and nice desktop and wall
> clocks. This of course is not what I am looking for but I wonder if anyone
> has had any experience with these timepieces and if they get good reception
> at various geographical locations.

I've used a couple of the WWVB derived clocks from Radio Shack for
a while now, the latest one bought using a coupon from their web
site a month or so ago, and it cost 20 bucks.

I live in Lakeland Florida, and with the antenna placed in the
window it works reasonably well, missing an occasional daily
update.

These clocks work MUCH better here in florida since WWVB raised
their transmitter power a few months ago.

Gary Sanders
WB0BZR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: Real time clock

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Tue, 22 Aug 2000 21:55:43 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104431-2000.08.23-00.02.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Also see http://www.ulio.com/timepr.html for well-engineered WWVB
receivers that lend themselves to TTL or RS-232 interfacing to a PC,
Basic Stamp, PIC, or other uP.

/tvb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: Real time clock

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Wed, 23 Aug 2000 01:36:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104446-2000.08.23-01.42.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John & group

Here is the link to Global Time Systems, mind you they are not cheap ... but
maybe a kit can be created using many common parts.

http://www.gtstime.com/display/index.htm

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] More links

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Wed, 23 Aug 2000 01:50:42 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-104449-2000.08.23-01.57.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Found the rest of my clock display links (at least there are choices)

http://www.interlog.com/~keratech/sclocks.htm

BRG does do custom work (some of my clients)
http://www.brgprecision.com/

Analog Dials (pick one !)
http://www.brgproducts.com/arc32.html

Digital have an option for 10 PPS and up to 7 inches high
[so I can see without my glasses on]
4 digit digital display
http://www.brgproducts.com/arc37.html

8 digit digital display
http://www.brgproducts.com/arc37.html

another company
http://teradon.com/Video/4Digital.htm

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: More links

From: Jack Warren <warren@mail-nh.eng.utr.ti.com>
Date: Wed, 23 Aug 2000 08:22:49 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: warren@rainier.eng.utr.ti.com
Message-ID: <LYR6754-104462-2000.08.23-07.29.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Howdy folks.

Here is a link to NISTs WWVB computer generated signal coverage maps:

http://www.boulder.nist.gov/timefreq/stations/wwvbcoverage.htm

The maps show 100uV/meter or greater signal strengths.

Regards,
Jack Warren
WB4MDC, FN42fv

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] NTP4 and TAC2/Oncore

From: kramrellim@home.com
Date: Sun, 27 Aug 2000 07:48:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105362-2000.08.27-07.57.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am interested in getting my Oncore VP to talk with my Linux box running
NTP. I have installed NTP 4.0.99k and am using kernel 2.2.16, but it does
not appear to work. In my ntp.conf file I have:

pps enable
server 127.127.30.0
fudge 127.127.30.0 stratum 0

here is the log file that is generated with I start ntpd

27 Aug 07:39:24 ntpd[171]: logging to file /home/internet/ntplog
27 Aug 07:39:24 ntpd[171]: ntpd 4.0.99k Sat Aug 26 11:13:52 /etc/localtime
2000 (1)
27 Aug 07:39:24 ntpd[171]: signal_no_reset: signal 13 had flags 4000000
27 Aug 07:39:24 ntpd[171]: set_process_priority: priority_done is <2>
27 Aug 07:39:24 ntpd[171]: precision = 18 usec
27 Aug 07:39:24 ntpd[171]: kern_enable is 1
27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041
27 Aug 07:39:24 ntpd[171]: refclock_newpeer: clock type 30 invalid
27 Aug 07:39:24 ntpd[171]: configuration of 127.127.30.0 failed
27 Aug 07:39:24 ntpd[171]: frequency initialized 0.000 from /etc/ntp/drift
27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041

Is there a definitive how to for this? It seems that most of the NTP
howtos then mention Oncore are outdated. Any help will be appreciated.

73
Mark
N5RFX

29. [tacgps] Re: NTP4 and TAC2/Oncore

From: "Jim King" <jim@jimking.net>
Date: Sun, 27 Aug 2000 08:21:02 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105365-2000.08.27-08.27.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"refclock_newpeer: clock type 30 invalid" indicates that you don't have
refclock_oncore compiled into ntpd. You need to rebuild ntpd with
refclock_oncore enabled.

Jim

----- Original Message -----
From: kramrellim@home.com
To: TAPR Special Interest Group
Sent: Sunday, August 27, 2000 7:48 AM
Subject: [tacgps] NTP4 and TAC2/Oncore

I am interested in getting my Oncore VP to talk with my Linux box running
NTP. I have installed NTP 4.0.99k and am using kernel 2.2.16, but it does
not appear to work. In my ntp.conf file I have:

pps enable
server 127.127.30.0
fudge 127.127.30.0 stratum 0

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2000 (1)
27 Aug 07:39:24 ntpd[171]: signal_no_reset: signal 13 had flags 4000000
27 Aug 07:39:24 ntpd[171]: set_process_priority: priority_done is <2>
27 Aug 07:39:24 ntpd[171]: precision = 18 usec
27 Aug 07:39:24 ntpd[171]: kern_enable is 1
27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041
27 Aug 07:39:24 ntpd[171]: refclock_newpeer: clock type 30 invalid
27 Aug 07:39:24 ntpd[171]: configuration of 127.127.30.0 failed
27 Aug 07:39:24 ntpd[171]: frequency initialized 0.000 from /etc/ntp/drift
27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041

Is there a definitive how to for this? It seems that most of the NTP howtos
then mention Oncore are outdated. Any help will be appreciated.

73
Mark
N5RFX

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

30. [tacgps] Re: NTP4 and TAC2/Oncore

From: kramrellim@home.com
Date: Sun, 27 Aug 2000 16:11:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105429-2000.08.27-16.18.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Jim,

After further investigation, it seems like I need a kernel patch to enable
the PPS input. But I have had no luck finding the patch for 2.2.16. Does
anybody know where this patch exits?

Thanks
Mark
N5RFX

At 08:21 AM 8/27/2000 -0500, you wrote:
>"refclock_newpeer: clock type 30 invalid" indicates that you don't have
>refclock_oncore compiled into ntpd. You need to rebuild ntpd with
>refclock_oncore enabled.
>
>Jim
>
>----- Original Message -----
>From: kramrellim@home.com
>To: TAPR Special Interest Group
>Sent: Sunday, August 27, 2000 7:48 AM
>Subject: [tacgps] NTP4 and TAC2/Oncore
>
>
>I am interested in getting my Oncore VP to talk with my Linux box running
>NTP. I have installed NTP 4.0.99k and am using kernel 2.2.16, but it does
>not appear to work. In my ntp.conf file I have:
>
>pps enable
>server 127.127.30.0
>fudge 127.127.30.0 stratum 0
>
>here is the log file that is generated with I start ntpd
>
>27 Aug 07:39:24 ntpd[171]: logging to file /home/internet/ntplog
>27 Aug 07:39:24 ntpd[171]: ntpd 4.0.99k Sat Aug 26 11:13:52 /etc/localtime
>2000 (1)
>27 Aug 07:39:24 ntpd[171]: signal_no_reset: signal 13 had flags 4000000
>27 Aug 07:39:24 ntpd[171]: set_process_priority: priority_done is <2>
>27 Aug 07:39:24 ntpd[171]: precision = 18 usec
>27 Aug 07:39:24 ntpd[171]: kern_enable is 1
>27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041
>27 Aug 07:39:24 ntpd[171]: refclock_newpeer: clock type 30 invalid
>27 Aug 07:39:24 ntpd[171]: configuration of 127.127.30.0 failed
>27 Aug 07:39:24 ntpd[171]: frequency initialized 0.000 from /etc/ntp/drift
>27 Aug 07:39:24 ntpd[171]: using kernel phase-lock loop 0041
>
>Is there a definitive how to for this? It seems that most of the NTP howtos
>then mention Oncore are outdated. Any help will be appreciated.
>
>73
>Mark
>N5RFX
>
>
>---
>You are currently subscribed to tacgps as: kramrellim@home.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] Re: NTP4 and TAC2/Oncore

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Sun, 27 Aug 2000 17:31:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105432-2000.08.27-16.38.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark,

The file you need is PPSkit-0.9.3.tar.gz

Locations are:
linux.kernel.org in directory /pub/linux/daemons/ntp/PPS
pcphy4.physik.uni-regensburg.de in directory /pub/wiu09524/PPS

PPS kit version must match the Linux kernel version as shown for a few
kits here:
PPSKit   Linux
0.9.3   2.2.16
0.9.2   2.2.14
0.9.1   2.2.13
0.8.1   2.2.12
0.7.2   2.2.12
0.6.1   2.2.6

0.5.2   2.2.4
0.4.2   2.2.0
0.3.10   2.0.36
0.3.3   2.0.31

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of
kramrellim@home.com
Sent: Sunday, August 27, 2000 5:12 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: NTP4 and TAC2/Oncore

Thanks Jim,

After further investigation, it seems like I need a kernel patch to
enable
the PPS input. But I have had no luck finding the patch for 2.2.16.
Does
anybody know where this patch exits?

Thanks
Mark
N5RFX

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

32. [tacgps] ANNOUNCEMENT: ARRL/TAPR 19th Annual DCC Sep. 22-24

From: "Steven R. Bible" <srbible@gate.net>
Date: Mon, 28 Aug 2000 10:23:35 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105586-2000.08.28-09.30.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Notice:
September 1, 2000 is the last day to receive the special hotel room rate of
$89/night single or double and the pre-registration price for the
conference.

ARRL and TAPR 19th Annual
Digital Communications Conference
September 22-24, 2000 - Orlando, Florida

For more information see: http://www.tapr.org/dcc

Information
Mark your calendar and start making plans to attend the year's premier event
in digital communications. The 19th Annual ARRL and TAPR Digital
Communications Conference will be held September 22-24, 2000, in Orlando,
Florida - just minutes from the Orlando International
Airport.

The ARRL and TAPR Digital Communications Conference is an international
forum for radio amateurs in digital communications, networking, and related
technologies to meet, publish their work, and present new ideas and
techniques for discussion. Presenters and attendees will have the
opportunity to exchange ideas and learn about recent hardware and software
advances, theories, experimental results, and practical applications. The
Digital Communications Conference is not just for the digital expert, but
also for digitally oriented amateurs of all levels of experience.

A Conference for the Beginner as well
The conference is not just for the digital expert. As in years past an
entire session strand with beginning, intermediate, and advanced
presentations on selected topics in digital communications will be offered.
Some of the topics will include: APRS, Satellite Communications, TCP/IP,
Digital Radio, Spread Spectrum and other introductory topics. Come to the
conference and hear these topics presented by the experts!

Area Attractions
The Orlando Florida area is famous for its attractions and vacation spots.

Disney World, Universal Studios, and Sea World (just to name a few) are within 15 minutes of the hotel. Shuttle service from the hotel will be available for a small fee. Cape Canaveral and Cocoa Beach are a 30 minute drive East of the hotel.

Symposia, Seminars and Banquet
Two symposia/seminars will be held which allow those with additional time and interest to make the most of the Conference. For those who may have interest in just one symposium or seminar, registration for the conference is not required to attend these activities. This allows maximum flexibility for those who may want to participate during the Digital Communications Conference, but do not have an entire weekend to devote to the event.

The Fourth APRS National Symposium will be held on Friday and will be moderated by Steve Dimse, K4HG (the developer of javAPRS). It will likely include many APRS software authors, such as Bob Bruninga, WB4APR (the father ofAPRS), Keith Sproul, WU2Z, Mark Sproul, KB2ICI (the developers of MacAPRS and WinAPRS), Brent Hildebrand, KH2Z (the developer of APRSPLUS), Mike Musick, N0QBF (developer of PocketAPRS), and other nationally known APRS leaders. Join this group for the afternoon and evening for in-depth discussions and presentations on the current and future status of APRS. This is a unique opportunity to gain insight into this fast-growing digital aspect of amateur operations that combines computers, packet radio, and GPS (Global Positioning System).

On Saturday night the DCC Banquet will be held. A guest speaker will speak after the banquet and a prize drawing will top the evening. The Grand Prize is a Palm VII Personal Digital Assistant and Synergy Systems LLC has donated two M12 development kits and many more.

The Sunday morning seminar will be focused on PIC development, design, and programming. This five-and-a-half hour seminar will focus on the things you need to know now in order to understand and begin to participate in PIC development.

Co-Hosts
The 2000 ARRL and TAPR Digital Communications Conference local co-hosts will be:
Lake Monroe Amateur Radio Society
  (http://www.qsl.net/lmars/),
Orange County ARES/RACES
  (http://evcom.net/~jvoisin/ares.htm),
Seminole County ARES/RACES
  (http://wwww.geocities.com/capecanaveral/launchpad/4773),
and Orlando Amateur Radio Club
  (http://www.oarc.org/).

International Co-Hosts PRUG (Packet Radio User Group of Japan) will be the International co-host for a third year running. PRUG will be hosting an informal social Friday evening before their seminar and symposium is held. Visit http://www.prug.or.jp for more information about PRUG.

Hotel
Conference presentations, meetings, and seminars will be held at the Orlando Airport Marriott. It is highly recommended that you book your room prior to arriving. A special DCC room rate of $89/single and $89/double per night has been blocked for 50 rooms and is available until September 1st, 2000. Once the 50 rooms have been reserved, room rates will increase. So be sure to book your rooms early! The hotel provides transportation to and from the Orlando International Airport. Please contact the hotel to arrange specific transportation needs.

Orlando Airport Marriott (conference hotel)
7499 Augusta Drive
Orlando, FL 32822
Phone 407-851-9000, Fax 407-857-6211
(http://marriotthotels.com/MCOAP/)

What you can expect at DCC 2000
- A full day of papers and breakouts for the beginner to the advanced
- Two seminars/symposiums
- The fifth annual Student Paper session.
- A banquet with Special Guest Speaker.
- Informal get-togethers throughout the weekend.
- TAPR Membership Meeting
- An event at which the most important new developments in amateur
  digital communications are announced.
- Digital 'movers and shakers' from all over the world in attendance.

There are few activities where your participation can be so much fun and important! What a great way to share and renew your enthusiasm for digital amateur radio! A get-together with colleagues and bringing each other up to date on your latest work -- all this, and more, for an unforgettable weekend of amateur radio and digital communications. We hope to see you at the ARRL and TAPR Digital Communications Conference on September 22-24, 2000!

Full information on the conference and hotel information can be obtained by contacting:

Tucson Amateur Packet Radio
Phone: (940) 383-0000.
Fax: (940) 566-2544
Email: tapr@tapr.org
Web: http://www.tapr.org

Registration Form
Contact the TAPR office by Phone 940-383-0000, Fax 940-566-2544, or Internet: http://www.tapr.org and tapr@tapr.org to register or for additional information.

Conference Registration includes: Conference Proceedings, Sessions, Meetings, and Lunch on Saturday.

- Pre-Registration (before Sept 1st)

$45.00 _____

- Registration (after Sept 1) or at door

$55.00 _____

- Saturday Evening Dinner (Limited Space)
Dinner with Guest Speaker
Prize Drawing

$30.00 _____

Symposia/Seminars

- 4th Annual APRS National Symposium
Friday, 1pm - 7pm. $25.00 _____

- Sunday Seminar
PIC Design, Development, and Programming

Sunday, 8:30 am - 2 pm. $20.00 _____

TOTAL _____

Name/Call:

Street Address:

City/State/Zip:

Country:

Phone Number:

Email:

Charge my credit card (circle one):

VISA MasterCard

Acct:

Expiration Date:

Signature on card:

Mail completed registration form with check to:
TAPR
8987-309 E Tanque Verde Rd #3378
Tucson, AZ 85749-9399

Or check http://www.tapr.org/dcc for an on-line registration form.

A registration packet will be mailed in September upon receipt of
registration form and payment.

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33. [tacgps] Re: M12 - DGPS

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 28 Aug 2000 15:45:56
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105672-2000.08.28-15.52.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I got a board from Synergy to interface the M12 to the TAPR DGPS Board. I
ran into some problems using the M12. It appears that when the M12 picks
up 9 satellites, the DGPS board hangs up and quits outputing corrections.
As long as its at 8 satellites and under, it generates DGPS. Anybody else
seen this problem.

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34. [tacgps] Re: DGPS -- some things to think about

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 28 Aug 2000 15:49:48
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105673-2000.08.28-15.56.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I ran a test last week using the Oncore VP to generate DGPS and used two
Garmin 12XLs to test with. The Garmin accepting DGPS showed a position box
of 2.504m x 2.899m and the Garmin without correction showed a box of 3.389m
x 4.051m. This was a 8 hour test with SA Watch.....

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35. [tacgps] Re: Real time clock

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Mon, 28 Aug 2000 17:55:39
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105701-2000.08.28-18.02.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Let me throw in a trick I used to keep timing from precision oscillators.
National Semiconductor use to make clock modules that used 50 or 60 hertz
timing reference. I built a divider from 10 Mhz down to 50 hertz and it
drove the clock. The timing signal was expected to be about 6 Vp-p, 50
hertz sine wave. I found if I made a TTL converter to convert and buffer
the 50 hertz to 8 volts square wave, it was enough to drive the clock.

Some GPS units put out 1 Khz, timing and one of the Motorola's puts out 100
hertz.....

This seems a little crazy considering that all GPS units put out timing,
one way or another.......

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36. [tacgps] Re: M12 - DGPS

From: "Steven R. Bible" <n7hpr@tapr.org>
Date: Mon, 28 Aug 2000 19:13:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105704-2000.08.28-18.20.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> I got a board from Synergy to interface the M12 to the TAPR DGPS
> Board. I
> ran into some problems using the M12. It appears that when the M12 picks
> up 9 satellites, the DGPS board hangs up and quits outputing

> corrections.
> As long as its at 8 satellites and under, it generates DGPS.
> Anybody else
> seen this problem.

Hello Brian,

The reason why is that the code I wrote for the TAPR DGPSIB was for the 8-channel Oncore VP. The VP only outputted 8 channels of DGPS corrections and padded the remainder of the Motorola Binary Message with zeros. Thus I ignored the zeros.

I have a new M12 (firmware 1.3) and have looked at what I need to do to update the firmware. Sadly, I haven't found the time to do the work. Once I write the changes, the PIC will need to be replaced in the DGPSIB. Thankfully, Microchip has introduced new FLASH PICs that I want to use. Alas, they have been behind in production and as of the middle of August finally I could purchase some.

As soon as I can clear a project off my workbench I'll get started with the coding and let everyone on the list know a new PIC is available for purchase from TAPR.

One question still remains with the M12, the lack of a position hold command. Hopefully Motorola will include it in future firmware upgrades.

73,

- Steve, N7HPR
  n7hpr@tapr.org

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37. [tacgps] Re: M12 - DGPS

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Mon, 28 Aug 2000 18:35:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105714-2000.08.28-18.46.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

OK, that explains it. I did not get any good long term data on it, but I did seem to hold position when it was outputing corrections.

What I was looking to do, is to put the M12 to use. I bought the eval kit from Synergy and its basically doing nothing but keeping time for me. I wanted to set up a DGPS base to use for mapping. I have been working with a volunteer fire department and one of the projects we came up with is to map all the fire hydrates in the area they serve. One of the problems is they often go further than they need to, to re-fill their trucks. By mapping it, they will be able to put all the points into a handheld gps and then look at the nearest 10 - and maybe save some time.

Let me know if you get a PIC programmed......be happy to test with you.

> ----------
> From: Steven R. Bible[SMTP:n7hpr@tapr.org]
> Reply To: TAPR Special Interest Group
> Sent: Monday, August 28, 2000 6:13 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: M12 - DGPS
>
>
> > I got a board from Synergy to interface the M12 to the TAPR DGPS
> > Board. I
> > ran into some problems using the M12. It appears that when the M12
> picks
> > up 9 satellites, the DGPS board hangs up and quits outputing
> > corrections.
> > As long as its at 8 satellites and under, it generates DGPS.
> > Anybody else
> > seen this problem.
>

>
> Hello Brian,
>
> The reason why is that the code I wrote for the TAPR DGPSIB was for the
> 8-channel Oncore VP. The VP only outputted 8 channels of DGPS corrections
> and padded the remainder of the Motorola Binary Message with zeros. Thus
> I
> ignored the zeros.
>
> I have a new M12 (firmware 1.3) and have looked at what I need to do to
> update the firmware. Sadly, I haven't found the time to do the work.
> Once
> I write the changes, the PIC will need to be replaced in the DGPSIB.
> Thankfully, Microchip has introduced new FLASH PICs that I want to use.
> Alas, they have been behind in production and as of the middle of August
> finally I could purchase some.
>
> As soon as I can clear a project off my workbench I'll get started with
> the
> coding and let everyone on the list know a new PIC is available for
> purchase
> from TAPR.
>
> One question still remains with the M12, the lack of a position hold
> command. Hopefully Motorola will include it in future firmware upgrades.
>
> 73,
>
> - Steve, N7HPR
>   n7hpr@tapr.org
>
>
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

38. [tacgps] (Fwd) Re: M12 - DGPS

From: info@synergy-gps.com
Date: Mon, 28 Aug 2000 16:48:28 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105715-2000.08.28-18.46.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve,

The Position Hold command is present in the M12, it's just different.

The Position Hold Position is input in exactly the same way as
previous receivers (@@As command), but the command header for
Position Control is "@@Gd" instead of "@@At" as in previous
oncores.

Randy

------------------ Reply Separator ------------

From: "Steven R. Bible" <n7hpr@tapr.org>
To: "TAPR Special Interest Group"
<tacgps@lists.tapr.org>
Subject: [tacgps] Re: M12 - DGPS Date sent: Mon, 28
Aug 2000
19:13:24 -0400 Send reply to: "TAPR Special Interest Group"
<tacgps@lists.tapr.org>

>
> > I got a board from Synergy to interface the M12 to the TAPR DGPS
> > Board. I
> > ran into some problems using the M12. It appears that when the M12
> > picks up 9 satellites, the DGPS board hangs up and quits outputing
> > corrections. As long as its at 8 satellites and under, it generates
> > DGPS. Anybody else seen this problem.
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> Hello Brian,
>

> The reason why is that the code I wrote for the TAPR DGPSIB was for the
> 8-channel Oncore VP. The VP only outputted 8 channels of DGPS
> corrections and padded the remainder of the Motorola Binary Message with
> zeros. Thus I ignored the zeros.
>
> I have a new M12 (firmware 1.3) and have looked at what I need to do to
> update the firmware. Sadly, I haven't found the time to do the work.
> Once I write the changes, the PIC will need to be replaced in the
> DGPSIB. Thankfully, Microchip has introduced new FLASH PICs that I want
> to use. Alas, they have been behind in production and as of the middle
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> As soon as I can clear a project off my workbench I'll get started with
> the coding and let everyone on the list know a new PIC is available for
> purchase from TAPR.
>
> One question still remains with the M12, the lack of a position hold
> command. Hopefully Motorola will include it in future firmware
> upgrades.
>
> 73,
>
> - Steve, N7HPR
>   n7hpr@tapr.org
>
>
>
>
> ---
> You are currently subscribed to tacgps as: randy@synergy-gps.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
 lat N 32.54' 43.9612 Lon W 117 06' 41.8060
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39. [tacgps] Re: DGPS -- some things to think about

From: "Steve Sampson" <S.Sampson@radio-link.net>
Date: Mon, 28 Aug 2000 19:36:52 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105731-2000.08.28-19.44.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

About a 1 metre improvement for about $500 USD expense.

----- Original Message -----

> I ran a test last week using the Oncore VP to generate DGPS and used two
> Garmin 12XLs to test with. The Garmin accepting DGPS showed a position box
> of 2.504m x 2.899m and the Garmin without correction showed a box of 3.389m
> x 4.051m. This was a 8 hour test with SA Watch.....

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40. [tacgps] Re: NTP4 and TAC2/Oncore

From: kramrellim@home.com
Date: Tue, 29 Aug 2000 05:38:24 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105886-2000.08.29-05.46.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Rick, Jeff all who helped me with NTP4 and the PPS kit. Now the
Oncore driver loads when I run ntpd, but in the log file now I get
configuration of 127.127.30.0 failed.

my ntp.conf file is very simple it is
server 127.127.30.0 prefer

```
fudge 127.127.30.0 stratum 0

I have done an ln -s /dev/ttyS0 /dev/oncore.pps.0 and
ln -s /dev/ttyS0 /dev/oncore.serial.0

I have tested to make sure the oncore is sending data into the PC and it is.

Are there any other things that I should have?  I see reference to an
/etc/ntp.oncore but I can't find an example

Any help is appreciated.

73
Mark
N5RFX


---
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```

41. [tacgps] Re: DGPS -- some things to think about

```
From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 29 Aug 2000 07:48:42 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105914-2000.08.29-07.55.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian Kirby wrote:
>
> I ran a test last week using the Oncore VP to generate DGPS and used two
> Garmin 12XLs to test with.  The Garmin accepting DGPS showed a position box
> of 2.504m x 2.899m and the Garmin without correction showed a box of 3.389m
> x 4.051m.  This was a 8 hour test with SA Watch.....

There are several things to think about, includingthe receiver noise in
the 12XL-class receiver, base station multipath environment and OnCore
noise.

I'll try to look at this with an Ashtech Z-12 and an OnCore base and
compare the results...

Gerry
--
Gerry Creager           gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering                     |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies               |Geodetic Control
Texas A&M University    979.458.4020  (Phone) -- 979.847.8578  (Fax)

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```

42. [tacgps] Re: M12 - DGPS

```
From: "Doug McKinney" <Design@mt.to>
Date: Tue, 29 Aug 2000 10:56:23 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105991-2000.08.29-13.07.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve, just got back fro Vegas and Art has sent me the updated 1.3.

Thanks
Doug

----- Original Message -----
From: "Steven R. Bible" <n7hpr@tapr.org>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, August 28, 2000 4:13 PM
Subject: [tacgps] Re: M12 - DGPS


>
> > I got a board from Synergy to interface the M12 to the TAPR DGPS
> > Board.  I
> > ran into some problems using the M12.  It appears that when the M12
picks
> > up 9 satellites, the DGPS board hangs up and quits outputing
```

> > corrections.
> > As long as its at 8 satellites and under, it generates DGPS.
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>
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> The reason why is that the code I wrote for the TAPR DGPSIB was for the
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> I have a new M12 (firmware 1.3) and have looked at what I need to do to
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> One question still remains with the M12, the lack of a position hold
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> 73,
>
> - Steve, N7HPR
>   n7hpr@tapr.org
>
>
>
>
> ---
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>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

43. [tacgps] Re: M12 - DGPS

From: "Steven R. Bible" <srbible@gate.net>
Date: Tue, 29 Aug 2000 14:18:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-105998-2000.08.29-13.25.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Wow, that was fast.

- Steve

> -----Original Message-----
> From: bounce-tacgps-5687@lists.tapr.org
> [mailto:bounce-tacgps-5687@lists.tapr.org]On Behalf Of Doug McKinney
> Sent: Tuesday, August 29, 2000 1:56 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: M12 - DGPS
>
>
> Steve, just got back fro Vegas and Art has sent me the updated 1.3.
>
> Thanks
> Doug
>
> ----- Original Message -----
> From: "Steven R. Bible" <n7hpr@tapr.org>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Monday, August 28, 2000 4:13 PM
> Subject: [tacgps] Re: M12 - DGPS

>
>
> >
> > > I got a board from Synergy to interface the M12 to the TAPR DGPS
> > > Board. I
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> >
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> I
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> > 73,
> >
> > - Steve, N7HPR
> >   n7hpr@tapr.org
> >
> >
> >
> >
> > ---
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> >
> >
> ---
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>

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September 2000

Original source file: tacgps.0009
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0009

1. [tacgps] I need a manual for a Leica MX8600

From: "Steve" <stevep@flashcom.net>
Date: Fri, 1 Sep 2000 00:16:34 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-106884-2000.09.01-02.24.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello to the list, Does anyone know where I can get a copy of the manual for a Leica MX8600 GPS receiver?
                          I picked one up at the swap meet but I don't know how to operate it.

thanks, Steve

---

2. [tacgps] Re: I need a manual for a Leica MX8600

From: "Jim King" <jim@jimking.net>
Date: Fri, 1 Sep 2000 07:22:05 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-106911-2000.09.01-07.29.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Give Leica's customer service a call. I called them a couple months looking for power and data connectors for a DGPS receiver I picked up on eBay and they were extremely helpful.

Jim

  ----- Original Message -----
  From: Steve
  To: TAPR Special Interest Group
  Sent: Friday, September 01, 2000 2:16 AM
  Subject: [tacgps] I need a manual for a Leica MX8600

  Hello to the list, Does anyone know where I can get a copy of the manual for a Leica MX8600 GPS receiver?
                          I picked one up at the swap meet but I don't know how to operate it.

  thanks, Steve

---

3. [tacgps] Re: NTP4 and TAC2/Oncore

From: kramrellim@home.com
Date: Sun, 03 Sep 2000 01:07:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-107237-2000.09.03-01.15.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

With the help of Reg.Clemens I finally got NTP 4.0 and the PPS kit
functioning in my old Tandy 486 50. I was looking around the Internet for
an explanation of the messages I am getting from the kernel about PPS
jitter and new frequency etc. Does anyone on the list know of a good
reference to explain these messages? And...

What could I do to make the clock more stable in a PC. Is there a crystal
I can change?

Thanks and 73,

Mark Miller
N5RFX

At 05:38 AM 8/29/2000 -0500, you wrote:
>Thanks Rick, Jeff all who helped me with NTP4 and the PPS kit. Now the
>Oncore driver loads when I run ntpd, but in the log file now I get
>configuration of 127.127.30.0 failed.
>
>my ntp.conf file is very simple it is
>server 127.127.30.0 prefer
>fudge 127.127.30.0 stratum 0
>
>I have done an ln -s /dev/ttyS0 /dev/oncore.pps.0 and
>ln -s /dev/ttyS0 /dev/oncore.serial.0
>
>I have tested to make sure the oncore is sending data into the PC and it is.

>
>Are there any other things that I should have? I see reference to an
>/etc/ntp.oncore but I can't find an example
>
>Any help is appreciated.
>
>73
>Mark
>N5RFX
>
>
>---
>You are currently subscribed to tacgps as: kramrellim@home.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Sunspots and GPS performance, and how accurate is moving GPS timing?

From: "Darryl Smith" <darryl@radio-active.net.au>
Date: Fri, 8 Sep 2000 20:52:19 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108211-2000.09.08-04.58.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

G'Day All

Someone asked me an interesting question... Do variations in sunspots cause
variations in the accuracy of GPS?

Also, I have read about the timing accuracy of a GPS Oncore being about 70
nSec out of the box, decreasing to 10 nSec when tuned. The question is, how
accurate is the timing when moving... I guess that this would be less
accurate, but how much less? are we talking 1000 nSec or 140 nsec? I know it
depends on geometry, but I would love a rough idea.

Many thanks

Darryl

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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5. [tacgps] Re: Sunspots and GPS performance, and how accurate is moving GPS timing?

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 08 Sep 2000 06:56:07 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108216-2000.09.08-07.03.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Darryl Smith wrote:
>
> G'Day All
>
> Someone asked me an interesting question... Do variations in sunspots cause
> variations in the accuracy of GPS?

Increased solar activity causes an increase in ionospheric
scintillation, increasing the scattering of the GPS signal, and
resulting, potentially, in increased delays, and diminished signal
strength that can result in degraded accuracy. Consumer-grade receivers
are single-frequency and thus cannot use the L2 data to calculate an
ionospheric component. A part of the almanac message includes an iono
model that some receivers incorporate into their processing. This
model, however, isn't really a substitute for having 2 frequencies at
your site and calculating the iono delay component, which is frequency
dependent.

73, gerry

```
--
Gerry Creager           gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering                     |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies               |Geodetic Control
Texas A&M University    979.458.4020  (Phone) -- 979.847.8578  (Fax)

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```

6. [tacgps] RE: Sunspots and GPS performance, and how accurate is moving GPS timing?

```
From: "Robert E. Martinson" <remartin@tiac.net>
Date: Fri, 8 Sep 2000 23:33:56 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108295-2000.09.08-22.41.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
Hi all,

The July 2000 issue of "GPS World" has a 7 page article on this subject
("GPS, the Ionosphere, and the Solar Maximum", pg. 44).  Maybe look at
www.gpsworld.com

73,
Bob Martinson
N1VQR@amsat.org
FN42jj



-----Original Message-----
From: bounce-tacgps-5665@lists.tapr.org
[mailto:bounce-tacgps-5665@lists.tapr.org]On Behalf Of Darryl Smith
Sent: Friday, September 08, 2000 6:52 AM
To: TAPR Special Interest Group
Subject: [tacgps] Sunspots and GPS performance, and how accurate is
moving GPS timing?


G'Day All

Someone asked me an interesting question... Do variations in sunspots cause
variations in the accuracy of GPS?

Also, I have read about the timing accuracy of a GPS Oncore being about 70
nSec out of the box, decreasing to 10 nSec when tuned. The question is, how
accurate is the timing when moving...  I guess that this would be less
accurate, but how much less? are we talking 1000 nSec or 140 nsec? I know it
depends on geometry, but I would love a rough idea.

Many thanks

Darryl

---------
Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names



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```

7. [tacgps] DCC Update 9/11/2000

```
From: "Steven R. Bible" <n7hpr@amsat.org>
Date: Mon, 11 Sep 2000 12:19:03 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108736-2000.09.11-11.26.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

19th Annual ARRL/TAPR Digital Communications Conference
Orlando, FL September 22-24, 2000

** Update 9/11/2000 **

A little more that one week away, the 19th Annual ARRL/TAPR Digital Communications Conference is about to begin. For detailed information about the conference, please visit the official DCC web page at http:www.tapr.org/dcc.

Registration for the conference will be taken at the door. Friday registration is for an entire afternoon APRS activities, demonstrations, and presentations. Saturday registration includes conference proceedings, lunch, and a full day of presentations. Saturday night includes Banquet, dinner speaker, and prize drawing. Sunday registration is for the PICmicro Design seminar.

Banquet Prize Drawings:
Grand Prize Kenwood TM-D700A (donated by Kenwood)
2nd Grand Prize Palm VII Personal Digital Assistant
Two Motorola Oncore M12 GPS Evaluation Kits (donated by Synergy Systems, LLC)

Map and coordinates:
A map of the conference hotel and coordinates are available at ftp://ftp.tapr.org/dcc/dcc.hotel.map.pdf

Speakers:
The following is a list of presenters. Preliminary schedule is available from ftp://ftp.tapr.org/dcc/2000.dcc.schedule.pdf

APRS Seminar - Friday September 22, 2000

John Ackerman, N9UR	APRS WG
Steve Bible, N7HPR	T-238 Weather Station
John Blowsky, KB2SCS	APRS LOOKUP
Steve Bragg, KA9MVA	HamHud
Bob Bruninga, WB4APR	APRSdos, satellite, etc.
Steve Dimse, K4HG	Internet APRS
Walter Dunckel, KD6VYV	Serial Control of D7/D700
John Hansen, W2FS	KISS TNC, D700 Keyboard
Dale Huguley, KG5QD	Weather Server
Larry Gahagan, AB0JM	Wildfire Support
Byon Garranrant, N6BG	TinyTrack
Mike Musick, N0QBF	PalmAPRS/Tracker construction
Robert Osband, N4SCY	Public Service with APRS
Tom Schaefer, NY4I	APRS Email Gateway
Darryl Smith, VK2TDS	APRS in the 2000 Olympics
The Sprouls, WU2Z/KB2ICI	Mac/Win/XAPRS
Rob Wittner, KZ5RW	APRS-CE

Main Session, Paper Presentation - Saturday 23, 2000
Titles and abstracts are available at http://www.tapr.org/tapr/html/Fcnc19.html

EasyTrak, A PIC Based Rotor/Radio Controller Interface
By Steve Bible N7HPR

APRS Tiny Web Pages
By Bob Bruninga WB4APR

Channel Capacity Simulation of Peer-to-Peer Spread Spectrum Satellite Transponders
By Matthew Ettus N2MJI

Correlation for Direct Sequence Spread Spectrum
By Panagiotis Gavalas

PIC-et Radio II: How to Receive AX.25 UI Frames Using Inexpensive PIC Microcontrollers
By John A. Hansen W2FS

Winlink 2000 ...A Global Ham Message Transfer and Deliver Network
By Hans Kessler N8PGR, Vic Poor W5SMM, Rick Muething KN6KZB, and Steve Waterman K4CJX

Frequency Offset Acquisition and Tracking Algorithms, Part 1 and Part 2
By Mohamed K. Nezami

External Common Gateway Interface (CGI) Access to FindU
By Thomas M. Schaefer NY4I

Server Applications within APRS Internet Server Environment
By Thomas M. Schaefer NY4I

APRS and the TAPR EasyTrak Az/El Rotor Control System
By Keith Sproul WU2Z

APRS and Kenwood TM-D700 Voice Messaging
By Keith Sproul WU2Z and Mark Sproul KB2ICI

Internet Wide Callsign Database using LDAP
By Mark Sproul KB2ICI

Automatic Voice Relay System
By Bob Bruninga WB4APR

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8. [tacgps] Survey GPS receiver

From: Glenn Little <glittle@awod.com>
Date: Mon, 11 Sep 2000 23:11:49 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108848-2000.09.11-22.34.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I just picked up a WM101 survey GPS receiver. This receiver was a joint venture of Magnavox Survey Systems, Inc and Wild Heerbrugg Survey Corp. THe Field Manual was printed in January 1988 in Switzerland. It has the L1-L2 mod installed. The receiver passes all self tests. Does not appear to acquire any satellites. Still have to check the coax from the receiver to the antenna and check the antenna on another receiver. With the L1-L2 mod this receiver may be the same as the WM102. It has RS-232 and RS-422 ports, although the pin definitions to the cannon type connectors is unknown.

Questions:

1. If this receiver has the 1024 week rollover problem, would it now track satellites since the event has passed?

2. If it has a Y2K problem will the improper date cause the fixes to be off?

3. If the receiver can be made to work, what kind of accuracy would be expected from it?

4. If the receiver can be made to work, would a receiver of this vintage make a good timing reference?

Any advise appreciated. It appears that Magnavox was an early contender for the Military and high end GPS market. The GPS division was later sold to Leica.

Glenn Little glittle@awod.com QCWA LM 28417
Amateur Callsign: WB4UIV wb4uiv@amsat.org AMSAT LM 2178
QTH: Goose Creek, SC USA (EM92xx) ARRL TAPR

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9. [tacgps] DGPS Reference Station

From: "Ray J. Vaughan" <ray@rayvaughan.com>
Date: Mon, 11 Sep 2000 23:51:40 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108852-2000.09.11-23.00.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I bought something this weekend at a ham fest and now I need to figure out what it does.

It's a "Magnavox MX4818 Differential GPS Reference Station". p/n 707384-801 s/n 815

It's a big blue box with an N type ANTENNA connector, 2 External Freq Std BNC connectors, 5 and 10 MHz, a connector for "CDU" and another for Data I/O. Both of these are connected to a Siamese cable marked "RS422 CONV".   Inside it has cards interconnected on the front with coax. One care has what looks like a crystal oven, another with e-proms, and then 6 cards that look the same.   Then 3 empty slots. The case is in mint condition.

Now... what does this thing do? Since it does say 'Station" could it actually generate a DGPS signal for transmission?   From a web search, I now know it dates from about 1987.   I get the impression it generates DGPS strings for transmission.   Could be great on a 440 frequency in my area.

Has anyone seen one of these? Or know what it's for? Or maybe have a manual?

Ray J. Vaughan, MS, CBTE, CERT
KD4BBM PG-7-15266
http://www.rayvaughan.com/
ray@rayvaughan.com
ray@2-way.com

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10. [tacgps] RE: DGPS Reference Station

From: "Lyle Johnson" <wa7gxd@email.msn.com>
Date: Mon, 11 Sep 2000 21:55:33 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108884-2000.09.12-00.04.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Magnavox sold the GPS stuff to Leica a few years back. Youshould be able to find them on the web under www.leica.com. The division is located in or near Redondo Beach, CA.

Lyle

> I bought something this weekend at a ham fest and now I need to
> figure out what it does.
>
> It's a "Magnavox MX4818 Differential GPS Reference Station".
> p/n 707384-801 s/n 815

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11. [tacgps] Re: Survey GPS receiver

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 12 Sep 2000 06:02:02 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108901-2000.09.12-06.09.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Glenn Little wrote:
>
> I just picked up a WM101 survey GPS receiver. This receiver was a joint
> venture of Magnavox Survey Systems, Inc and Wild Heerbrugg Survey
> Corp. THe Field Manual was printed in January 1988 in Switzerland. It has
> the L1-L2 mod installed. The receiver passes all self tests. Does not
> appear to acquire any satellites. Still have to check the coax from the
> receiver to the antenna and check the antenna on another receiver. With
> the L1-L2 mod this receiver may be the same as the WM102. It has RS-232
> and RS-422 ports, although the pin definitions to the cannon type
> connectors is unknown.
>
> Questions:
>
> 1. If this receiver has the 1024 week rollover problem, would it now track
> satellites since the event has passed?
>
> 2. If it has a Y2K problem will the improper date cause the fixes to be off?
>
> 3. If the receiver can be made to work, what kind of accuracy would be

> expected from it?
>
> 4. If the receiver can be made to work, would a receiver of this vintage
> make a good timing reference?
>
> Any advise appreciated. It appears that Magnavox was an early contender for
> the Military and high end GPS market. The GPS division was later sold to
> Leica.

I'd contact Leica and see if their tech support can help. I an't answer
any of tthese wuestions offhand, as I've no experience with this
receiver... but in my experience, Leica Tech Support have always been
pretty helpful.

73, gerry n5jxs
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
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12. [tacgps] Re: DGPS Reference Station

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 12 Sep 2000 06:08:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-108904-2000.09.12-06.15.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Ray J. Vaughan" wrote:
>
> I bought something this weekend at a ham fest and now I need to figure out what it does.
>
> It's a "Magnavox MX4818 Differential GPS Reference Station".   p/n 707384-801 s/n 815
>
> It's a big blue box with an N type ANTENNA connector, 2 External Freq Std BNC connectors, 5 and 10
MHz, a connector for "CDU" and another for Data I/O. Both of these are connected to a Siamese cable
marked "RS422 CONV".   Inside it has cards interconnected on the front with coax. One care has what
looks like a crystal oven, another with e-proms, and then 6 cards that look the same.   Then 3 empty
slots.   The case is in mint condition.
>
> Now... what does this thing do? Since it does say 'Station" could it actually generate a DGPS signal
for transmission?   From a web search, I now know it dates from about 1987.   I get the impression it
generates DGPS strings for transmission.   Could be great on a 440 frequency in my area.
>
> Has anyone seen one of these? Or know what it's for? Or maybe have a manual?

Pure guess but I think you have exactly what it says it is. Whether
it'll work for you is problemmatic. I've not worked with these
receivers, so I think you'd have to check with Leica's tech support for
more info. I suspect it will run OK without the external freq standard
inputs. Relize it may have lost its mind at the W1K rollover or at Y2K.

Good luck & 73, gerry
--
Gerry Creager   gerry@cs.tamu.edu, gerry@page4.cs.tamu.edu
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Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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13. [tacgps] ION Meeting in Salt Lake City

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sun, 17 Sep 2000 17:05:42 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Phil Karn <karn@qualcomm.com>, Bob McGwier <rwmcgwier@home.com>
Message-ID: <LYR6754-109805-2000.09.17-12.13.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rick Hambly & I will be in Salt Lake this next week for the ION meeting. I
wonder if anyone else will also be there.

I'm involved in two papers that may be of interest to the TACGPS community.
The first is in session E2 on Wed. afternoon where we (Rick, Reza Abtahi
and I) will present the paper "Low-Cost, High Accuracy Timing". To see this
paper, go to my FTP site at

     ftp://tac.gsfc.nasa.gov/pub/incoming/

There you will find a series of files named "ion-time". The Powerpoint
slide set is ion-time.ppt, the MS Word version of the proceedings paper is
ion-time.doc, and a PDF version of the text paper is ion-time.pdf.

In the timing paper we break the news of the project that we've been
working on for a number of months -- the prototype of a brand-new timing
receiver that looks like it outdoes the venerable old (and now
discontinued) ONCORE VP. The new receiver uses Reza's firmware dropped into
a SiRF board made by Axiom. Even though its still a prototype, I think
you'll be be impressed.

And FYI -- the new SiRF-based timing receiver is also an EXCELLENT
12-channel DGPS base station at the same time. And yes, carrier phase
output is planned.

The second ION paper (by Bruce Schupler and me) is in the closing session
on Friday and reports on our anechoic chamber antenna testing. This is the
first place where we have reported on the performance of the new Javad
choke-ring antennas. This paper is in the files named "ion-ant". Sorry I
don't have the Powerpoint slides to post yet.

During the week following ION, the IGS has a workshop at the USNO here in
the DC area, and Mon/Tues will be the forum for the IGS/BIPM folks working
on clocks/timing to get together. Our ION timing paper will be recycled at
the IGS meeting.

Sorry that we can't also be at the DCC in Orlando.

73, Tom

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14. [tacgps] Re>ION Meeting in Salt Lake City

From: Bill Powell <bpowell@intrex.net>
Date: Sun, 17 Sep 2000 15:45:44 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109824-2000.09.17-14.54.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,
I for one am most grateful that you've posted these excellent papers for
us all to appreciate. I'm sure that the majority of us will be unable
to attend the ION conference, and appreciate being able to have access
to this quality material as amateurs.

73,
Bill Powell af4jg

"Dr Thomas A Clark (W3IWI)" wrote:
>
> Rick Hambly & I will be in Salt Lake this next week for the ION meeting. I
> wonder if anyone else will also be there.
>
> I'm involved in two papers that may be of interest to the TACGPS community.
> The first is in session E2 on Wed. afternoon where we (Rick, Reza Abtahi
> and I) will present the paper "Low-Cost, High Accuracy Timing". To see this
> paper, go to my FTP site at
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>
> There you will find a series of files named "ion-time". The Powerpoint
> slide set is ion-time.ppt, the MS Word version of the proceedings paper is
> ion-time.doc, and a PDF version of the text paper is ion-time.pdf.
>
> In the timing paper we break the news of the project that we've been
> working on for a number of months -- the prototype of a brand-new timing

> receiver that looks like it outdoes the venerable old (and now
> discontinued) ONCORE VP. The new receiver uses Reza's firmware dropped into
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> the DC area, and Mon/Tues will be the forum for the IGS/BIPM folks working
> on clocks/timing to get together. Our ION timing paper will be recycled at
> the IGS meeting.
>
> Sorry that we can't also be at the DCC in Orlando.
>
> 73, Tom
>
> ---
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15. [tacgps] Re: ION Meeting in Salt Lake City

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 17 Sep 2000 20:46:51 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109866-2000.09.17-20.54.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>
> Rick Hambly & I will be in Salt Lake this next week for the ION meeting. I
> wonder if anyone else will also be there.
>
> I'm involved in two papers that may be of interest to the TACGPS community.
> The first is in session E2 on Wed. afternoon where we (Rick, Reza Abtahi
> and I) will present the paper "Low-Cost, High Accuracy Timing". To see this
> paper, go to my FTP site at
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>   ftp://tac.gsfc.nasa.gov/pub/incoming/
>
> There you will find a series of files named "ion-time". The Powerpoint
> slide set is ion-time.ppt, the MS Word version of the proceedings paper is
> ion-time.doc, and a PDF version of the text paper is ion-time.pdf.
>
> In the timing paper we break the news of the project that we've been
> working on for a number of months -- the prototype of a brand-new timing
> receiver that looks like it outdoes the venerable old (and now
> discontinued) ONCORE VP. The new receiver uses Reza's firmware dropped into
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> During the week following ION, the IGS has a workshop at the USNO here in
> the DC area, and Mon/Tues will be the forum for the IGS/BIPM folks working
> on clocks/timing to get together. Our ION timing paper will be recycled at
> the IGS meeting.

Tom,

I'm arriving about 1630 Tuesday, plus-er-minus American Airlines. I'll
be looking for you and sitting in your sessions!

Maybe we can commit dinner... I also have to catch up with Dennis
Milbert and Charlie Chalstrom from NGS.

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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16. [tacgps] Re: ION Meeting in Salt Lake City

From: "Steve Sampson" <S.Sampson@radio-link.net>
Date: Sun, 17 Sep 2000 20:57:05 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109868-2000.09.17-21.05.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

P.S. Leave off the pub below, and make it:

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----- Original Message -----

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>
>   ftp://tac.gsfc.nasa.gov/pub/incoming/
>

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17. [tacgps] Re: ION Meeting in Salt Lake City

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Mon, 18 Sep 2000 02:15:22 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109872-2000.09.17-21.23.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager N5JXS wrote:
>
> "Dr Thomas A Clark (W3IWI)" wrote:
> >
> > Rick Hambly & I will be in Salt Lake this next week for the ION meeting. I
> > wonder if anyone else will also be there.
> >
> > I'm involved in two papers that may be of interest to the TACGPS community.
> > The first is in session E2 on Wed. afternoon where we (Rick, Reza Abtahi
> > and I) will present the paper "Low-Cost, High Accuracy Timing". To see this
> > paper, go to my FTP site at
> >
> >   ftp://tac.gsfc.nasa.gov/pub/incoming/
> >
> > There you will find a series of files named "ion-time". The Powerpoint
> > slide set is ion-time.ppt, the MS Word version of the proceedings paper is
> > ion-time.doc, and a PDF version of the text paper is ion-time.pdf.
> >
> > In the timing paper we break the news of the project that we've been
> > working on for a number of months -- the prototype of a brand-new timing
> > receiver that looks like it outdoes the venerable old (and now
> > discontinued) ONCORE VP. The new receiver uses Reza's firmware dropped into
> > a SiRF board made by Axiom. Even though its still a prototype, I think
> > you'll be be impressed.
> >
> > And FYI -- the new SiRF-based timing receiver is also an EXCELLENT
> > 12-channel DGPS base station at the same time. And yes, carrier phase
> > output is planned.
> >

> > The second ION paper (by Bruce Schupler and me) is in the closing session
> > on Friday and reports on our anechoic chamber antenna testing. This is the
> > first place where we have reported on the performance of the new Javad
> > choke-ring antennas. This paper is in the files named "ion-ant". Sorry I
> > don't have the Powerpoint slides to post yet.
> >
> > During the week following ION, the IGS has a workshop at the USNO here in
> > the DC area, and Mon/Tues will be the forum for the IGS/BIPM folks working
> > on clocks/timing to get together. Our ION timing paper will be recycled at
> > the IGS meeting.
>
> Tom,
>
> I'm arriving about 1630 Tuesday, plus-er-minus American Airlines. I'll
> be looking for you and sitting in your sessions!
>
> Maybe we can commit dinner... I also have to catch up with Dennis
> Milbert and Charlie Chalstrom from NGS.
>
> 73, gerry

Rick & I will both be at the Shiloh. Cell fone = 301-379-6964.

I'm arriving late tomorrow, Rick is coming Tues mid-day.

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] Re: ION Meeting in Salt Lake City

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 18 Sep 2000 06:36:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109911-2000.09.18-06.44.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>
> Rick & I will both be at the Shiloh. Cell fone = 301-379-6964.
>
> I'm arriving late tomorrow, Rick is coming Tues mid-day.

I'm at the Quality, phone currently unknown. I'll give you a call!

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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19. [tacgps] Final Update - DCC Orlando, FL Sep 22-24, 2000

From: "Steven R. Bible" <srbible@gate.net>
Date: Mon, 18 Sep 2000 12:33:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-109956-2000.09.18-11.46.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

19th Annual ARRL/TAPR Digital Communications Conference
Orlando, FL □ September 22-24, 2000

** Final Update 9/18/2000 **

Counting down the final days until the 19th Annual ARRL/TAPR Digital
Communications Conference this weekend in Orlando, Florida. For detailed
information about the conference, please visit the official DCC web page at
http:www.tapr.org/dcc.

Registration for the conference will be taken at the door. Friday
registration is for an entire afternoon APRS activities, demonstrations, and
presentations. Saturday registration includes conference proceedings,
lunch, and a full day of presentations. Saturday night includes Banquet,
dinner speaker, and prize drawing. Sunday registration is for the PICmicro
Design seminar.

DCC Social:
Please join us Friday evening at 7:00 PM for a social get together time.
The social is generously hosted by the Packet Radio Users Group of Japan
(PRUG).

PRUG Presentation:
Friday night the Packet Radio Users Group of Japan will present talks on
their progress on high-speed digital networks in Japan.

Saturday Night Banquet Speaker:
Mr. Doug Campbell, of Triton Network Systems (http://www.triton-network.com)
will be our DCC Banquet Speaker. Triton Network Systems is located in
Orlando, Florida.

Vice President Product Management, Marketing, & International Business as
Vice President of International Sales, Marketing and Product Management, Mr.
Campbell leads the assessment of global community needs and spearheads the
development of Triton Network Systems' product and marketing strategies.

Mr. Campbell cultivated his management skills in sales, marketing and
product development working 17 years for Nortel Networks. While based in
Singapore, he built a multifunctional pan-Asian team, which successfully
captured a 100% market share with MCI-WorldCom Asia, successfully
introducing a number of new products. Prior to this, Mr. Campbell was
instrumental in the establishment of an SDH broadband equipment joint
venture in China and served as a member of the company's Board of Directors.

Mr. Campbell received a Bachelor of Engineering Physics degree from the
Royal Military College of Canada in Kingston, Canada, and a Master of
Business Administration from IMD (University of Lausanne) in Switzerland.

Banquet Prize Drawings:
Grand Prize □ Kenwood TM-D700A (donated by Kenwood)
2nd Grand Prize □ Palm VII Personal Digital Assistant (donated by TAPR)
Two Motorola Oncore M12 GPS Evaluation Kits (donated by Synergy Systems,
LLC)
Microchip PICSTART-PLUS PICmicro Programmer (donated by Microchip)

PIC Seminar Prize Drawing
Microchip MPLAB-ICD (donated by Microchip)

Project and Demonstration Room:
The DCC is a place where people can talk about their projects and gain ideas
for new ones. The Project and Demonstration Room has become a recent DCC
tradition where people can bring and display their projects. The room will
be located next to the registration room and across the hall from the main
presentation room. The Project and Demonstration Room will open at
registration time and be closed (locked) 11:00 PM Friday and Saturday night.

Map and coordinates:
A map of the conference hotel and coordinates are available at
ftp://ftp.tapr.org/dcc/2000.dcc.hotel.map.pdf

Speakers:
The following is a list of presenters. PDF version available from
ftp://ftp.tapr.org/dcc/2000.dcc.speakers.pdf

Speaking schedule (subject to change) is available from
ftp://ftp.tapr.org/dcc/2000.dcc.schedule.pdf

APRS Seminar - Friday September 22, 2000

John Ackerman, N9UR	APRS WG
Steve Bible, N7HPR	T-238 Weather Station
John Blowsky, KB2SCS	APRS LOOKUP
Bob Bruninga, WB4APR	APRSdos, satellite, etc.
Steve Dimse, K4HG	Internet APRS
Walter Dunckel, KD6VYV	Serial Control of D7/D700
John Hansen, W2FS	KISS TNC, D700 Keyboard
Dale Huguley, KG5QD	Weather Server
Larry Gahagan, AB0JM	Wildfire Support
Byon Garranrant, N6BG	TinyTrack
Mike Musick, N0QBF	PalmAPRS/Tracker construction
Robert Osband, N4SCY	Public Service with APRS
Tom Schaefer, NY4I	APRS Email Gateway
Darryl Smith, VK2TDS	APRS in the 2000 Olympics
The Sprouls, WU2Z/KB2ICI	Mac/Win/XAPRS
Rob Wittner, KZ5RW	APRS-CE

Main Session, Paper Presentation - Saturday 23, 2000
Titles and abstracts are available at
http://www.tapr.org/tapr/html/Fcnc19.html

EasyTrak, A PIC Based Rotor/Radio Controller Interface
By Steve Bible N7HPR

APRS Tiny Web Pages
By Bob Bruninga WB4APR

Channel Capacity Simulation of Peer-to-Peer Spread Spectrum Satellite
Transponders
By Matthew Ettus N2MJI

Correlation for Direct Sequence Spread Spectrum
By Panagiotis Gavalas

PIC-et Radio II: How to Receive AX.25 UI Frames Using Inexpensive PIC
Microcontrollers
By John A. Hansen W2FS

Winlink 2000 ...A Global Ham Message Transfer and Deliver Network
By Hans Kessler N8PGR, Vic Poor W5SMM, Rick Muething KN6KZB, and Steve
Waterman K4CJX

Frequency Offset Acquisition and Tracking Algorithms, Part 1 and Part 2
By Mohamed K. Nezami

APRS and the TAPR EasyTrak Az/El Rotor Control System
By Keith Sproul WU2Z

APRS and Kenwood TM-D700 Voice Messaging
By Keith Sproul WU2Z and Mark Sproul KB2ICI

Internet Wide Callsign Database using LDAP
By Mark Sproul KB2ICI

Automatic Voice Relay System
By Bob Bruninga WB4APR

Introductory Sessions - Saturday 23, 2000

Intro to Packet Radio
By John Ackerman, N8UR

Intro to APRS
By Guy Story, KC5QOI

Intro to Digital Satellites
By Barry Baines, WD4ASW

Into to HF Digital
TBD

Intro to Software Defined Radios
By Steve Bible, N7HPR

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20. [tacgps] RE: ION Meeting in Salt Lake City

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Mon, 18 Sep 2000 13:04:15 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "Phil Karn" <karn@qualcomm.com>, "Bob McGwier" <rwmcgwier@home.com>
Message-ID: <LYR6754-109970-2000.09.18-12.12.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

RE: "Low-Cost, High Accuracy Timing"
by Thomas A. Clark (W3IWI), Richard M. Hambly (W2GPS) and Reza Abtahi.

The paper and viewgraphs that Tom mentioned in his message, are
undergoing important last minute changes. For those of you who have
downloaded copies of these files, please get the replacement files,

which have some important corrections. You can find links to these
files of our Web page at http://www.gpstime.com/.

Additional files are at ftp://www.gpstime.com/pub/ION-GPS2000/.

The files at the NASA site are still the old files, so don't use them,
please.

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Dr Thomas A Clark
(W3IWI)
Sent: Sunday, September 17, 2000 1:06 PM
To: TAPR Special Interest Group
Cc: Phil Karn; Bob McGwier
Subject: [tacgps] ION Meeting in Salt Lake City

Rick Hambly & I will be in Salt Lake this next week for the ION meeting.
I
wonder if anyone else will also be there.

I'm involved in two papers that may be of interest to the TACGPS
community.
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and I) will present the paper "Low-Cost, High Accuracy Timing". To see
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     ftp://tac.gsfc.nasa.gov/pub/incoming/

There you will find a series of files named "ion-time". The Powerpoint
slide set is ion-time.ppt, the MS Word version of the proceedings paper
is
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working on for a number of months -- the prototype of a brand-new timing
receiver that looks like it outdoes the venerable old (and now
discontinued) ONCORE VP. The new receiver uses Reza's firmware dropped
into
a SiRF board made by Axiom. Even though its still a prototype, I think
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And FYI -- the new SiRF-based timing receiver is also an EXCELLENT
12-channel DGPS base station at the same time. And yes, carrier phase
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During the week following ION, the IGS has a workshop at the USNO here
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the DC area, and Mon/Tues will be the forum for the IGS/BIPM folks
working
on clocks/timing to get together. Our ION timing paper will be recycled
at
the IGS meeting.

Sorry that we can't also be at the DCC in Orlando.

73, Tom

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---
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21. [tacgps] RE: ION Meeting in Salt Lake City

From: Brooks Shera <ebs@lanl.gov>
Date: Mon, 18 Sep 2000 16:12:14 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-110009-2000.09.18-17.18.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I believe the first equation in the time paper is still off by a factor
of 10.

>The paper and viewgraphs that Tom mentioned in his message, are
>undergoing important last minute changes. For those of you who have
>downloaded copies of these files, please get the replacement files,
>which have some important corrections. You can find links to these
>files of our Web page at http://www.gpstime.com/.
>
>Additional files are at ftp://www.gpstime.com/pub/ION-GPS2000/.
>
>The files at the NASA site are still the old files, so don't use them,
>please.

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22. [tacgps] RE: ION Meeting in Salt Lake City

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Mon, 18 Sep 2000 18:40:18 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-110013-2000.09.18-17.48.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

Good eye! You are quite correct. This error has been fixed in the paper
and on the PowerPoint slide. All new files have been uploaded.

The error was caught just in time to get into the ION paper submittal
and presentation materials.

Thanks,
Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Brooks Shera
Sent: Monday, September 18, 2000 6:12 PM
To: TAPR Special Interest Group
Subject: [tacgps] RE: ION Meeting in Salt Lake City

I believe the first equation in the time paper is still off by a factor
of 10.

>The paper and viewgraphs that Tom mentioned in his message, are
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>which have some important corrections. You can find links to these
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>
>Additional files are at ftp://www.gpstime.com/pub/ION-GPS2000/.
>
>The files at the NASA site are still the old files, so don't use them,
>please.

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23. [tacgps] Abreviation for "year"?

From: Jon Iza <iapizloj@bi.ehu.es>
Date: Wed, 20 Sep 2000 11:15:49 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-110278-2000.09.20-04.29.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Folks,
Recently I've seen the use of "a" (I suppose from Latin "annum") as
an abreviation for year. It's not SI (not at least at www.bipm.fr) but
it will solve the problem for some units, such as drift of very stable
systems which can be rated on units/year (as u/a)...
Anybody can enlighten us?

jon, ea2sn

--
Dr. Jon Iza / Chem.& Environ. Engng. / University of the Basque Country
Escuela de Ingenieros / Alda. Urquijo s/n / E-48013 Bilbao   -Spain-
Ph +34-946014098   Fax +34-946014179   <mailto:iapizloj@bi.ehu.es>
Goza de tu poco, mientras busca mas el loco Ham: ea2sn (a real qrp'er)
** "What hath God wrought?" ---- World's first e-mail (1844) **

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24. [tacgps] "a" for year

From: Jon Iza <iapizloj@bicc00.bi.ehu.es>
Date: Thu, 28 Sep 2000 06:00:43 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-111625-2000.09.28-01.08.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Folks,
many thanks for your emails regarding the use of "a" a abbreviation
for year.
I've consulted both Prof. Rowlett from UNC
        http://www.unc.edu/~rowlett/units/index.html
and the real horse's mouth, the SI site at bipm.fr and the final word is
that it is suggested on an ISO standard (I think ISO 31:1) which deals
with Time measurements.
The SI does not deal with it, but it looks like there are some
scientific
journals and societies which are using it right now, i.e. the
International Astronomical Union
        http://www.iau.org/units.html

Looks like I was on the right track...
Be well
jon, ea2sn

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25. [tacgps] TAPR Press Release

From: John Ackermann <jra@febo.com>
Date: Fri, 29 Sep 2000 13:17:50 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: tapr-bb@lists.tapr.org, aprssig@lists.tapr.org, netsig@lists.tapr.org,
        bbssig@lists.tapr.org, picsig@lists.tapr.org, hfsig@lists.tapr.org,
        tacgps@lists.tapr.org, tapr-org@lists.tapr.org, htaprs@lists.tapr.org
Message-ID: <LYR6754-111841-2000.09.29-12.29.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

FOR IMMEDIATE RELEASE

TAPR Elects Officers at 19th Annual Digital Communications Conference

John Ackermann, N8UR, was elected the new president of TAPR at the 19th
ARRL/TAPR Digital Communications Conference held in Orlando September 21-24.

135 hams, including a dozen from outside the US, attended the annual event,
which includes presentation of technical papers, hands-on demonstrations,
and beginner's sessions. Over 100 people attended Friday afternoon's APRS

seminar, and 70 were present for a technical symposium on programming PIC chips held Sunday morning.

Ackermann succeeds Greg Jones, WD5IVD, who had served as president since 1993, with Steve Bible, N7HPR, replacing Ackermann as vice president. Bob Hanson, N2GDE, will continue to serve as secretary, and Jim Neely, WA5LHS, remains treasurer. The elections were held at TAPR's annual board meeting, held in conjunction with the DCC.

"Greg Jones led TAPR through a period of growth and innovation," Ackermann said. "On his watch, we brought significant new products to market, including the DSP-93 digital signal processing unit, Totally Accurate Clock, and Mic-E and Pic-E data encoders. Greg also laid the groundwork for our Frequency Hopping Spread Spectrum Radio project. He guided us into the Internet age, along the way creating the TAPR SIG mailing lists that now handle thousands of messages per month. Greg is also responsible for our increased publishing activities. His retirement leaves a void in TAPR that will be hard to fill."

Ackermann said that his primary objective will be to ensure that TAPR remains on the cutting edge of radio technology, with a special emphasis on emerging concepts such as Software Defined Radios. He will also focus on increasing membership and optimizing the organization's management structure.

Ackermann (ex-AG9V), who lives in Dayton, Ohio, has served on the TAPR Board of Directors and as vice president since 1995. He was first licensed in 1974 and has helped build packet radio networks in Ohio and Wisconsin. Ackermann is active on APRS, runs a Linux-based Internet site at his home, and can occasionally be found on CW chasing DX.

Bible lives in Kingsland, Georgia, and has been a TAPR Board member since 1996. He was project manager for TAPR's Totally Accurate Clock (TAC-2), EVM Radio Interface, PIC Encoder, and DGPS Reference Station kits. Bible is leading TAPR's development of a road map to develop Software Defined Radio technology for amateur use.

In other news from the DCC:

* TAPR announced that it will be offering the "EasyTrak" satellite rotor and radio controller. This PIC-based unit will control azimuth and elevation rotors for satellite use, as well as tune popular radios for Doppler correction.

* PRUG, the Packet Radio Users Group of Japan, demonstrated the possibilities of low cost Internet-connected sensors and software mobile agent technology. PRUG also introduced the TINI-AMEDES, a Java based one-board computer with Ethernet interface which supports the Dallas Semiconductor 1-wire interface, and provided an update on their 2.4Ghz spread spectrum radio, which has been commercialized by Root, Inc.

* Geoffrey Dick, WA4IKQ, was winner of the grand prize awarded at the Saturday evening banquet. Geoff won a TM-D700 APRS-capable mobile radio donated by Kenwood.

DCC 2001 will be held in Cincinnati, Ohio from September 21-23, 2001. Conference coordinators will be Steve and Sheila Bible assisted by local coordinator Hank Greeb, N8XX.

About TAPR
TAPR (officially, Tucson Amateur Packet Radio, Inc.) is a non-profit research and development corporation dedicated to advancing amateur radio through digital technology. It focuses on development of hardware and software tools that enable ham radio operators to explore leading edge technologies. Despite its name, TAPR is an international organization with over 2000 members worldwide.

Contact information:
Telephone: (940) 383-0000
Email: tapr@tapr.org
Web: http://www.tapr.org

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October 2000

Original source file: tacgps.0010
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0010

1. [tacgps] GPS Antenna

From: Scott Tillman <dpseng@primenet.com>
Date: Mon, 02 Oct 2000 15:49:20 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-112443-2000.10.02-18.01.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've recently purchases a GPS antenna (for work) from
Radiall/Larsen #GPS0014.
This antenna is designed for timing applications. It uses a
N connector and a 1" pipe mount. Here at 33.5N SA sez 9 sat
average and 6 minimum tracked, and not at least unusual to
have my Garmin II+ tracking 12 sats at a time (currently 7
of 10 are full scale signal level with 60' of LMR400 coax
between ant and Rx). While list is $300 or so our contract
price was $128. I'm not sure what the open market cost is
but it is working really nice for me. We got it from TESSCO
(.com).

Scott Tillman   K7YSV

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2. [tacgps] 10 MHz from GPS

From: "Darryl Smith" <darryl@radio-active.net.au>
Date: Thu, 5 Oct 2000 20:02:11 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-112953-2000.10.05-04.07.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

G'Day

A friend of mine is interested in getting 10 MHz locked to GPS. I am sure I
have read this on TAPR somewhere but now I cannot find it. Has anyone done
this?

Many thanks

Darryl

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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3. [tacgps] Re: 10 MHz from GPS

From: Ian Roberts <ITR@Nanoteq.co.za>
Date: Thu, 05 Oct 2000 11:12:41 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-112954-2000.10.05-04.21.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

http://members.nbci.com/GPSprojects/

Darryl Smith wrote:
>
> G'Day
>
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> have read this on TAPR somewhere but now I cannot find it. Has anyone done
> this?
>
> Many thanks
>
> Darryl

>
> ---------
> Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
> Mobile Number 0412 929 634 [+61 4 12 929 634 International]
> Darryl@radio-active.net.au | www.radio-active.net.au for domain names
>
> ---
> You are currently subscribed to tacgps as: itr@nanoteq.co.za
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Re: 10 MHz from GPS

From: John Franke <j.m.franke@larc.nasa.gov>
Date: Thu, 5 Oct 2000 07:01:18 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-112960-2000.10.05-06.09.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>G'Day
>
>A friend of mine is interested in getting 10 MHz locked to GPS. I am sure I
>have read this on TAPR somewhere but now I cannot find it. Has anyone done
>this?
>
>Many thanks
>
>Darryl
>
>---------
>Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
>Mobile Number 0412 929 634 [+61 4 12 929 634 International]
>Darryl@radio-active.net.au | www.radio-active.net.au for domain names
>
>
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

Try:

http://www.rt66.com/~shera/

John

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: 10 MHz from GPS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 05 Oct 2000 06:28:54 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-112962-2000.10.05-06.37.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Darryl Smith wrote:
>
> G'Day
>
> A friend of mine is interested in getting 10 MHz locked to GPS. I am sure I
> have read this on TAPR somewhere but now I cannot find it. Has anyone done
> this?

Depends on the receiver. (Tom does the SiRF chipset have a 10MHz
output?) I saw one receiver boardset with a 10 MHz output at ION GPS
from Rockwell Collins, but admittedly, I was not looking for this. A
lot of receivers offer 1 pulse per second output.

73, gerry
(ps: Got the diary: It's a hoot!)
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on

Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University 979.458.4020 (Phone) -- 979.847.8578 (Fax)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] 10 MHz from GPS

From: Brooke Clarke <brooke@pacific.net>
Date: Fri, 06 Oct 2000 22:41:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-113476-2000.10.07-00.52.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Darryl:

Check out the Stanford Research PRS10.
It takes in a 1 PPS and outputs a 1 PPS and 10 MHz.
See my web page: http://www.pacificsites.com/~brooke/PRS10.shtml

This Rb source is more stable (IMHO) than the HP 5060A Cs source.

73,

Brooke, N6GCE

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] GPS-20 gives up

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Tue, 10 Oct 2000 10:12:46 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-114115-2000.10.10-09.22.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Yesterday my Garmin GPS-20 GPS receiver gave up the ghost. It had been
running reliably for about 3 years and had been doing a good job recently
steering my two time standards with Brooks Shera's GPS controllers. There is
no 1 PPS output and TAC32 reports 8 satellites visible, 0 tracked. I haven't
taken the cover off yet to see if anything has come loose inside. Could it
be that the on-board battery has simply died? If I have to replace the
receiver, could anyone tell me what is presently considered the best choice
for timing purposes and that would easily interface with the TAC2 board. I
would like to get it through TAPR if possible.

Thanks, John

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

8. [tacgps] GARC Meeting Invitation

From: Pat Kilroy <pat.kilroy@gsfc.nasa.gov>
Date: Tue, 17 Oct 2000 15:22:34 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-115467-2000.10.17-14.32.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

You are invited to the next monthly Goddard Amateur Radio
Club (GARC) meeting! We will gather at the WA3NAN facility
in Greenbelt, Maryland at NASA Goddard. That's tomorrow,
Wednesday, October 18 (like always, the third Wednesday of
each month except December) at 5:30 P.M.

Informal talk-in on WA3NAN/R 146.835 MHz FM.

DIRECTIONS
From Greenbelt Road, go north on Soil Conservation Service
Road passing the GSFC Visitor Center entrance and also the
GSFC East Gate entrance on your left. Pass the GSFC Motor
Pool on your right and take the very next right turn through
Gate 10. Welcome!

Coordinates: N 38 59' 56.1", W076 50' 47.5"

Hpe to CU there!

73 de Pat N8PK

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

November 2000

Original source file: tacgps.0011
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0011

1. [tacgps] GPS Timing

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Wed, 8 Nov 2000 18:56:38
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-118776-2000.11.08-19.06.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Got a question on the Motorola Oncore VP. Just how does it derive timing?
Are we phase locking on the spread spectrum code (and if so, are we
averaging when we have X satellites in view ?). Also, does it compansate
for the propagation delay from the satellite to the receiver ?

Dr Clark, we have not heard much about your new GPS project, fill us in.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: GPS Timing

From: Brooks Shera <ebs@lanl.gov>
Date: Thu, 9 Nov 2000 09:18:55 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-118862-2000.11.09-10.29.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The timing might be considered something of a byproduct of the position
calculation. The transit time of signals between the gps receiver and 4
or more satellites is observed. From these 4 times and the known
position of the satellites at the instant the signals were transmitted,
the position of the receiver can be computed. The observed transit times
must be corrected for the error in the clock of the gps receiver. This
error is computed along with the receiver position, which is why 4 sats
are required not just 3. So now the gps receiver knows its clock error
and it makes the appropriate adjustment and spits out the 1 pps pulse at
the proper GPS time. The receiver does this calculation every second.

This explanation is rather simplified but maybe you get the idea.

Brooks

>Got a question on the Motorola Oncore VP. Just how does it derive timing?
>Are we phase locking on the spread spectrum code (and if so, are we
>averaging when we have X satellites in view ?). Also, does it compansate
>for the propagation delay from the satellite to the receiver ?
>
>Dr Clark, we have not heard much about your new GPS project, fill us in.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: GPS Timing

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Thu, 9 Nov 2000 19:17:16 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-118916-2000.11.09-19.28.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am looking for the "deep" technical details....thanks.

> ----------
> From: Brooks Shera[SMTP:ebs@lanl.gov]
> Reply To: TAPR Special Interest Group
> Sent: Thursday, November 09, 2000 10:18 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: GPS Timing
>
> The timing might be considered something of a byproduct of the position
> calculation. The transit time of signals between the gps receiver and 4
> or more satellites is observed. From these 4 times and the known
> position of the satellites at the instant the signals were transmitted,
> the position of the receiver can be computed. The observed transit times

> must be corrected for the error in the clock of the gps receiver. This
> error is computed along with the receiver position, which is why 4 sats
> are required not just 3. So now the gps receiver knows its clock error
> and it makes the appropriate adjustment and spits out the 1 pps pulse at
> the proper GPS time. The receiver does this calculation every second.
>
> This explanation is rather simplified but maybe you get the idea.
>
> Brooks
>
>
> >Got a question on the Motorola Oncore VP. Just how does it derive
> timing?
> >Are we phase locking on the spread spectrum code (and if so, are we
> >averaging when we have X satellites in view ?). Also, does it compansate
>
> >for the propagation delay from the satellite to the receiver ?
> >
> >Dr Clark, we have not heard much about your new GPS project, fill us in.
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

4. [tacgps] John Elliss - please stand up

From: Brooks Shera <ebs@lanl.gov>
Date: Tue, 14 Nov 2000 17:44:57 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-119748-2000.11.14-18.57.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Sorry for the bandwidth, but a friend is looking for a PCB design by John
Ellis, ke6qlb, who probably still reads this group. If you are out there
John please send me (not the group) your current e-mail address. Tnx.

Brooks
shera@rt66.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Ultra Wide Band

From: "Brian Kirby" <brian.kirby@msfc.nasa.gov>
Date: Thu, 30 Nov 2000 1:13:45
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-122150-2000.11.30-01.26.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Found a NTIA report were they have started some UWB test to see how its
going to impact GPS. Its located at:

http://www.ntia.doc.gov/osmhome/uwbtestplan/gpsuwbtp.htm

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

December 2000

Original source file: tacgps.0012
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0012

1. [tacgps] Analog clock

From: Pete Warren <pete@tramat.com>
Date: Sun, 10 Dec 2000 09:41:33 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-123908-2000.12.10-08.54.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Good morning,

1. I'm new to your list. This is the first message.
2. Help and direction is why I'm bothering you.
3. To pay for your help, I do all sorts of specialty machining, primarily restoration of antique clocks.
4. My understanding of electronics is grounded (no pun) in US Navy Guided Missile work in the 50's.
That was all vacuum tube. I have studied and worked out many projects using digital stuff, but nothing to the level of programmable material.
5. Currently, I would like to work out a very accurate, analog dial clock, to be used in my shop as a "regulator". As well, it would have "customer appeal", that is, a clock that could be advertised as being linked to the GPS system, and therefore super accurate.

6. Some background. Over the past year or two I have experimented with commercially available ($40) "radio controlled" clocks. These items are tuned to WWVB, 60 KHz, and IF they get the signal, do an acceptable job of keeping the clock movement in sync with the standard. Because my shop is at or below ground level, the signal is flaky at best and simply can not be relied upon.
I have attempted to separate the clock from the ferrite loop stick antenna and this does not work. The task of separating the clock movement from the radio / electronic control package is very involved in that there are a variety of switch contacts and optical sensors that communicate the clock's mechanical position to the control package, and these do not lend themselves to remote location.
Enough of WWVB. On to GPS. My investigation tells me there are GPS units available that will output a pulse every second. I have some sketchy ideas about using this pulse to drive a cannibalized quartz clock movement. By removing the crystal time base oscillator, and directing the GPS pulse through a flip flop circuit to the coil of the clock stepping motor (which requires a polarity reversal on every other pulse) the end MAY be achieved.
The distance between the receiver / antenna and the actual clock dial would be about 30 feet (to the roof of the house).
If anybody is interested, or has any comments (other that I'm a nut) please let me know.

Thanks to all, in advance.

Pete Warren
Keene, NH
603-352-5498

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] RE: Analog clock

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Sun, 10 Dec 2000 10:21:00 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "'pete@tramat.com'" <pete@tramat.com>
Message-ID: <LYR6754-123930-2000.12.10-10.33.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

There are several GPS systems that have a TTL 1PPS signal. Most need some sort of buffer, as they are one gate and cannot drive a big load.
Typically a 74AC04 is used by connecting several gates in parallel.

Synergy LLC carries the Motorola line of GPS, http://www.synergy-gps.com/

30 feet could probally be carried on RG-59 coax. CNS System at

http://gw.cnssys.com/tac32/ makes a commercial clock and they make the
software that most of us use for our Motorola GPS boards. In the back of
the TAC32 reference manual there is a several page chart on coax loss at GPS
frequencies.

> ----------
> From: Pete Warren[SMTP:pete@tramat.com]
> Reply To: TAPR Special Interest Group
> Sent: Sunday, December 10, 2000 8:41 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Analog clock
>
> Good morning,
>
>   1.   I'm new to your list. This is the first message.
>   2.   Help and direction is why I'm bothering you.
>   3.   To pay for your help, I do all sorts of specialty
> machining, primarily restoration of antique clocks.
>   4.   My understanding of electronics is grounded (no pun) in US
> Navy Guided Missile work in the 50's.
>   That was all vacuum tube. I have studied and worked out
> many projects using digital stuff, but nothing to the level of
> programmable material.
>   5.   Currently, I would like to work out a very accurate, analog
> dial clock, to be used in my shop as a "regulator". As well, it would
> have "customer appeal", that is, a clock that could be advertised as
> being linked to the GPS system, and therefore super accurate.
>
>   6.   Some background. Over the past year or two I have
> experimented with commercially available ($40) "radio controlled"
> clocks. These items are tuned to WWVB, 60 KHz, and IF they get the
> signal, do an acceptable job of keeping the clock movement in sync with
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> flaky at best and simply can not be relied upon.
>   I have attempted to separate the clock from the ferrite loop
> stick antenna and this does not work. The task of separating the clock
> movement from the radio / electronic control package is very involved in
> that there are a variety of switch contacts and optical sensors that
> communicate the clock's mechanical position to the control package, and
> these do not lend themselves to remote location.
>   Enough of WWVB. On to GPS. My investigation tells me there are
> GPS units available that will output a pulse every second. I have some
> sketchy ideas about using this pulse to drive a cannibalized quartz
> clock movement. By removing the crystal time base oscillator, and
> directing the GPS pulse through a flip flop circuit to the coil of the
> clock stepping motor (which requires a polarity reversal on every other
> pulse) the end MAY be achieved.
>   The distance between the receiver / antenna and the actual clock
> dial would be about 30 feet (to the roof of the house).
>   If anybody is interested, or has any comments (other that I'm a
> nut) please let me know.
>
>   Thanks to all, in advance.
>
>   Pete Warren
>   Keene, NH
>   603-352-5498
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

3. [tacgps] RE: Analog clock

From: Dave Martindale <davem@cs.ubc.ca>
Date: Sun, 10 Dec 2000 11:55:06 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-123956-2000.12.10-14.07.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If you really want a "regulator" system, with multiple slave clocks all
synced to each other, I'd suggest using serial transmission of the time
on a pair of wires, and a microcontroller at each clock. This would work
something like this:

Place a GPS antenna somewhere it has a good view of the sky. Somewhere

convenient nearby (but indoors) place a GPS receiver. Connect the GPS
serial data output plus the 1 PPS timing pulse to a microcontroller.
The microcontroller could be programmed with software that looks at the
serial data stream, extracts the time (and possibly date) info, and watches
the 1 PPS pulse. Then, at the beginning of every second, it writes a
sequence of bits that identify the time and date down a 2-wire cable.
If you use serial line drivers intended for long-distance transmission
(RS-422 or RS-485 for example), the cable can be hundreds of feet long.

Each slave clock can be digital or analog. In the case of a digital clock,
it merely needs to extract the data from a serial receiver and format it for
display. Again, a microcontroller is simple and cheap, but discrete logic
or a PAL could be used. For an analog clock, the "burst" of serial data seen
on the wire is used to step the motor one step, and that's all that is needed
for an analog clock that keeps correct time once set. For an analog clock
that automatically resets itself when its power comes back on, you need
a microcontroller and some sort of encoders on the clock mechanism to read
back what is currently displayed, or at least a signal that indicates a "home"
position of each hand.

Now, the complexity of the software in the controllers depends on whether
you insist on the clocks being exactly right to the millisecond, or whether
you're willing to tolerate the clocks always being about half a second late.
If you don't mind the half-second delay, you can have the "master" avoid
sending out the time until it actually receives it from the GPS receiver,
which is always delayed a bit. In that case, you can use almost any
consumer GPS receiver, you don't need the 1 PPS output. Similarly, the
"slave" clocks can wait until they've received the whole data burst
before displaying anything.

If you want really precise time, with no visible error at all, you need
a GPS receiver with 1 PPS output. The "master" controller also needs to
be more complex, since it needs to calculate what the next second will
be and send that out instantly when it sees the 1 PPS pulse, or possibly
in advance of that, before it has seen the serial data for that second
from the GPS itself. And it needs to have some strategy for dealing with
leap seconds.

        Dave

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] RE: Analog clock

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 10 Dec 2000 15:41:56 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-123965-2000.12.10-15.55.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Here is one on MANY companies offering digital clock systems with
GPS capabilities. I posted a number of these web links quite a while back

http://www.timezonedisplay.com/

G Beat

----- Original Message -----
From: "Dave Martindale" <davem@cs.ubc.ca>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, December 10, 2000 1:55 PM
Subject: [tacgps] RE: Analog clock

> If you really want a "regulator" system, with multiple slave clocks all
> synced to each other, I'd suggest using serial transmission of the time
> on a pair of wires, and a microcontroller at each clock. This would work
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> convenient nearby (but indoors) place a GPS receiver. Connect the GPS
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> The microcontroller could be programmed with software that looks at the
> serial data stream, extracts the time (and possibly date) info, and
watches
> the 1 PPS pulse. Then, at the beginning of every second, it writes a
> sequence of bits that identify the time and date down a 2-wire cable.
> If you use serial line drivers intended for long-distance transmission

> (RS-422 or RS-485 for example), the cable can be hundreds of feet long.
>
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>
> Now, the complexity of the software in the controllers depends on whether
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late.
> If you don't mind the half-second delay, you can have the "master" avoid
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> which is always delayed a bit. In that case, you can use almost any
> consumer GPS receiver, you don't need the 1 PPS output. Similarly, the
> "slave" clocks can wait until they've received the whole data burst
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>
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> be more complex, since it needs to calculate what the next second will
> be and send that out instantly when it sees the 1 PPS pulse, or possibly
> in advance of that, before it has seen the serial data for that second
> from the GPS itself. And it needs to have some strategy for dealing with
> leap seconds.
>
> Dave
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: GPS Clocks

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 10 Dec 2000 15:46:37 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-123966-2000.12.10-15.59.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Global Time is another option.
http://www.gtstime.com/display/index.htm

G. Beat

----- Original Message -----
From: "Dave Martindale" <davem@cs.ubc.ca>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, December 10, 2000 1:55 PM
Subject: [tacgps] RE: Analog clock

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> convenient nearby (but indoors) place a GPS receiver. Connect the GPS
> serial data output plus the 1 PPS timing pulse to a microcontroller.
> The microcontroller could be programmed with software that looks at the

> serial data stream, extracts the time (and possibly date) info, and
watches
> the 1 PPS pulse. Then, at the beginning of every second, it writes a
> sequence of bits that identify the time and date down a 2-wire cable.
> If you use serial line drivers intended for long-distance transmission
> (RS-422 or RS-485 for example), the cable can be hundreds of feet long.
>
> Each slave clock can be digital or analog. In the case of a digital
clock,
> it merely needs to extract the data from a serial receiver and format it
for
> display. Again, a microcontroller is simple and cheap, but discrete logic
> or a PAL could be used. For an analog clock, the "burst" of serial data
seen
> on the wire is used to step the motor one step, and that's all that is
needed
> for an analog clock that keeps correct time once set. For an analog clock
> that automatically resets itself when its power comes back on, you need
> a microcontroller and some sort of encoders on the clock mechanism to read
> back what is currently displayed, or at least a signal that indicates a
"home"
> position of each hand.
>
> Now, the complexity of the software in the controllers depends on whether

> you insist on the clocks being exactly right to the millisecond, or
whether
> you're willing to tolerate the clocks always being about half a second
late.
> If you don't mind the half-second delay, you can have the "master" avoid
> sending out the time until it actually receives it from the GPS receiver,
> which is always delayed a bit. In that case, you can use almost any
> consumer GPS receiver, you don't need the 1 PPS output. Similarly, the
> "slave" clocks can wait until they've received the whole data burst
> before displaying anything.
>
> If you want really precise time, with no visible error at all, you need
> a GPS receiver with 1 PPS output. The "master" controller also needs to
> be more complex, since it needs to calculate what the next second will
> be and send that out instantly when it sees the 1 PPS pulse, or possibly
> in advance of that, before it has seen the serial data for that second
> from the GPS itself. And it needs to have some strategy for dealing with
> leap seconds.
>
> Dave
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re: Analog clock

From: Bob Smith <bobsmith5@home.com>
Date: Mon, 11 Dec 2000 10:19:15 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124060-2000.12.11-09.31.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Pete --

Please clarify what you mean by "Analog dial". Is it just
the style of the dial, or some constraint on the workings?

        Thanks, Bob Smith

Pete Warren wrote:
>
> Good morning,
>
>   1.   I'm new to your list. This is the first message.
>   2.   Help and direction is why I'm bothering you.

> 3. To pay for your help, I do all sorts of specialty
> machining, primarily restoration of antique clocks.
> 4. My understanding of electronics is grounded (no pun) in US
> Navy Guided Missile work in the 50's.
> That was all vacuum tube. I have studied and worked out
> many projects using digital stuff, but nothing to the level of
> programmable material.
> 5. Currently, I would like to work out a very accurate, analog
> dial clock, to be used in my shop as a "regulator". As well, it would
> have "customer appeal", that is, a clock that could be advertised as
> being linked to the GPS system, and therefore super accurate.
>
> 6. Some background. Over the past year or two I have
> experimented with commercially available ($40) "radio controlled"
> clocks. These items are tuned to WWVB, 60 KHz, and IF they get the
> signal, do an acceptable job of keeping the clock movement in sync with
> the standard. Because my shop is at or below ground level, the signal is
> flaky at best and simply can not be relied upon.
> I have attempted to separate the clock from the ferrite loop
> stick antenna and this does not work. The task of separating the clock
> movement from the radio / electronic control package is very involved in
> that there are a variety of switch contacts and optical sensors that
> communicate the clock's mechanical position to the control package, and
> these do not lend themselves to remote location.
> Enough of WWVB. On to GPS. My investigation tells me there are
> GPS units available that will output a pulse every second. I have some
> sketchy ideas about using this pulse to drive a cannibalized quartz
> clock movement. By removing the crystal time base oscillator, and
> directing the GPS pulse through a flip flop circuit to the coil of the
> clock stepping motor (which requires a polarity reversal on every other
> pulse) the end MAY be achieved.
> The distance between the receiver / antenna and the actual clock
> dial would be about 30 feet (to the roof of the house).
> If anybody is interested, or has any comments (other that I'm a
> nut) please let me know.
>
> Thanks to all, in advance.
>
> Pete Warren
> Keene, NH
> 603-352-5498
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

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----
* * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith Smith Machine Works, Inc.
internet bobsmith5@home.com 9900 Lumlay Road
landline 804/745-1065 Richmond, Virginia
23236+1004

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: Analog clock

From: "Dominic Wu" <dwu@Swales.com>
Date: Mon, 11 Dec 2000 09:35:05 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124078-2000.12.11-11.47.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob,

I think Pete means analog dials, with a mechanical (quartz) movement, driven
by GPS "pulses" to be super accurate as opposed to the likes of Rolex
watches that lose 30 seconds a month...

-----Original Message-----
From: bounce-tacgps-11946@lists.tapr.org
[mailto:bounce-tacgps-11946@lists.tapr.org]On Behalf Of Bob Smith
Sent: Monday, December 11, 2000 7:19 AM
To: TAPR Special Interest Group

Subject: [tacgps] Re: Analog clock

Pete --

Please clarify what you mean by "Analog dial". Is it just
the style of the dial, or some constraint on the workings?

Thanks, Bob Smith

Pete Warren wrote:
>
> Good morning,
>
> 1. I'm new to your list. This is the first message.
> 2. Help and direction is why I'm bothering you.
> 3. To pay for your help, I do all sorts of specialty
> machining, primarily restoration of antique clocks.
> 4. My understanding of electronics is grounded (no pun) in US
> Navy Guided Missile work in the 50's.
> That was all vacuum tube. I have studied and worked out
> many projects using digital stuff, but nothing to the level of
> programmable material.
> 5. Currently, I would like to work out a very accurate, analog
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> The distance between the receiver / antenna and the actual clock
> dial would be about 30 feet (to the roof of the house).
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> nut) please let me know.
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> Thanks to all, in advance.
>
> Pete Warren
> Keene, NH
> 603-352-5498
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

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systems * *
Robert L. (Bob) Smith Smith Machine Works, Inc.
internet bobsmith5@home.com 9900 Lumlay Road
landline 804/745-1065 Richmond, Virginia
23236+1004

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---
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8. [tacgps] Re: Analog clock

From: Bob Smith <bobsmith5@home.com>
Date: Mon, 11 Dec 2000 15:48:40 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124089-2000.12.11-15.00.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Ok this is a subject that I have given some considerable
thought to.
Starting from there I suggest stepper motors to drive the
hands. One for the sweep second hand which could be
programmed to advance the second in precise one second
increments like those nice little quartz clocks that hang on
every wall everywhere these days (but rarely run well for
more that a few years, or alternately, to advance in small
increments like some mechanical watches to give the
appearance of a rapid tick rate.

A second stepper to drive the minute hand. The hour hand to
be geared to the minute hand in the conventional sense. The
assembly to be driven by a MCU synchronized to GPS.
A hole drilled in the periphery of one of the drive gears
and a photo interrupter should suffice to keep the steppers
in synchronization.

A battery pack or perhaps one of the little baby UPS
supplies so common today to keep the whole mess running
during outages.

        Bob Smith

Dominic Wu wrote:
>
> Bob,
>
> I think Pete means analog dials, with a mechanical (quartz) movement, driven
> by GPS "pulses" to be super accurate as opposed to the likes of Rolex
> watches that lose 30 seconds a month...
>
> -----Original Message-----
> From: bounce-tacgps-11946@lists.tapr.org
> [mailto:bounce-tacgps-11946@lists.tapr.org]On Behalf Of Bob Smith
> Sent: Monday, December 11, 2000 7:19 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Analog clock
>
> Pete --
>
> Please clarify what you mean by "Analog dial". Is it just
> the style of the dial, or some constraint on the workings?
>
>   Thanks, Bob Smith
>
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> >
> > Good morning,
> >
> >   1.   I'm new to your list. This is the first message.
> >   2.   Help and direction is why I'm bothering you.
> >   3.   To pay for your help, I do all sorts of specialty
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> >   4.   My understanding of electronics is grounded (no pun) in US
> > Navy Guided Missile work in the 50's.
> >   That was all vacuum tube. I have studied and worked out
> > many projects using digital stuff, but nothing to the level of
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> >   5.   Currently, I would like to work out a very accurate, analog
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> >   6.   Some background. Over the past year or two I have
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> > sketchy ideas about using this pulse to drive a cannibalized quartz
> > clock movement. By removing the crystal time base oscillator, and
> > directing the GPS pulse through a flip flop circuit to the coil of the
> > clock stepping motor (which requires a polarity reversal on every other
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> > The distance between the receiver / antenna and the actual clock
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> > If anybody is interested, or has any comments (other that I'm a
> > nut) please let me know.
> >
> > Thanks to all, in advance.
> >
> > Pete Warren
> > Keene, NH
> > 603-352-5498
> >
> > ---
> > You are currently subscribed to tacgps as: bobsmith5@home.com
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> --
>
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> -------------
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> systems * *
> Robert L. (Bob) Smith   Smith Machine Works, Inc.
> internet   bobsmith5@home.com   9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia
> 23236+1004
>
> ---
> You are currently subscribed to tacgps as: dwu@swales.com
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--

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23236+1004

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9. [tacgps] Re: Analog clock

From: Craig Cherry <craig.cherry@kalmia.com>
Date: Mon, 11 Dec 2000 22:06:59 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124177-2000.12.12-00.19.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Pete,

Jeffrey Maier published a project showing how to drive a quartz clock
movement from a 1 PPS signal in "The Home Shop Machinist" magazine. His
project uses a thermally compensated pendulum to supply the 1 PPS signal,
but it should be pretty simple to adapt the design to use the 1 PPS signal

from a suitable GPS receiver. It's at least a three part article. Part 1
was in the September/October issue, and part 2 is in the November/December
issue. I don't have Part 1 at hand, but I believe it covered the quartz
movement modification. You won't need Part 2 - it describes how to build
the pendulum and support. I've seen this clock run at a local show - it's
quite nice.

For contact information see http://www.homeshopmachinist.net/

Hope this helps -

Craig Cherry

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] RE: Analog clock

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Mon, 11 Dec 2000 22:45:31 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124188-2000.12.12-00.59.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

All,

Some years ago, Hewlett-Packard made a very handsome analog clock,
driven (I believe) by a syncronous motor, at some frequency derived
from a WWVB receiver.

Come to think about it, I may still have one of those clocks in my
basement (without the WWVB receiver).

-- Flemming Larsen, KB6ADS

>

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11. [tacgps] Re: Analog clock

From: Craig Cherry <craig.cherry@kalmia.com>
Date: Mon, 11 Dec 2000 23:03:27 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124197-2000.12.12-01.20.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Woops - I posted some bad information. I dug around and found Part 1 of
the article I mentioned - it has an overview of the project and then gets
into the mechanical construction. The quartz movement modification hasn't
been published yet. I must have been thinking of the conversation I had
with Mr. Maier a couple of years ago, when he showed me this clock.

Using a quartz movement as Jeffrey describes won't provide the features of
the alternative schemes others have mentioned here, (automatic setting of
the hands at power up, negative leap second support, etc.), but it is a
very simple way to drive a "real clock face" for demo purposes. Given a
reliable power source for the GPS receiver, a simple quartz movement should
work for the always on, fixed location application Pete described.

It's interesting to note that Jeffrey reports his home built pendulum
movement (built of steel, brass and aluminum) has shown an error as small
as 0.8 seconds over a six day period. Not up there with a GPS based
system, but useful for some purposes if the satellites aren't available.

Craig

> Pete,
>
> Jeffrey Maier published a project showing how to drive a quartz clock
> movement from a 1 PPS signal in "The Home Shop Machinist" magazine.
> His project uses a thermally compensated pendulum to supply the
> 1 PPS signal, but it should be pretty simple to adapt the design to use

> the 1 PPS signal from a suitable GPS receiver. It's at least a three part
> article. Part 1 was in the September/October issue, and part 2 is in the
> November/December issue. I don't have Part 1 at hand, but I believe
> it covered the quartz movement modification. You won't need Part 2 -
 > it describes how to build the pendulum and support. I've seen this
 > clock run at a local show - it's quite nice.
>
> For contact information see http://www.homeshopmachinist.net/
>
> Hope this helps -
>
> Craig Cherry

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Re: Analog clock

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Mon, 11 Dec 2000 23:14:35 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124198-2000.12.12-01.26.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Almost all quartz analog clocks are driven by tiny bi-polor
or uni-polar stepper motors. I've taken some apart and
found the pulses to be only a few 10s of microseconds
wide and just a volt or two in amplitude. Usually there is
only one coil winding so the polarity of the current reverses
every other second.

So it would be relatively simple for a microcontroller to
take a GPS-derived 1 PPS as input and generate the
alternating polarity stepper motor drive pulses as output.

The result is that for a few dollars in hardware your analog
clock would be sync'ed to GPS time.

Places like Klockit (http://www.klockit.com/) have a large
selection of quartz movements. Most have second hands
and some even have 24 h dials.

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: tacgps digest: December 11, 2000

From: Pete Warren <pete@tramat.com>
Date: Tue, 12 Dec 2000 06:58:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124203-2000.12.12-06.10.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

TAPR Special Interest Group digest wrote:

> TAPR Special Interest Group Digest for Monday, December 11, 2000.
>
> 1. Re: Analog clock
> 2. Re: Analog clock
> 3. Re: Analog clock
>
> ---
>
> Subject: Re: Analog clock
> From: Bob Smith <bobsmith5@home.com>
> Date: Mon, 11 Dec 2000 10:19:15 -0500
> X-Message-Number: 1
>
> Pete --
>
> Please clarify what you mean by "Analog dial". Is it just
> the style of the dial, or some constraint on the workings?
>
>   Thanks, Bob Smith

> Subject: Re: Analog clock
> From: "Dominic Wu" <dwu@Swales.com>
> Date: Mon, 11 Dec 2000 09:35:05 -0800
> X-Message-Number: 2
>
> Bob,
>
> I think Pete means analog dials, with a mechanical (quartz) movement, driven
> by GPS "pulses" to be super accurate as opposed to the likes of Rolex
> watches that lose 30 seconds a month...
> Pete --
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> Please clarify what you mean by "Analog dial". Is it just
> the style of the dial, or some constraint on the workings?
>
>   Thanks, Bob Smith
>
> Pete Warren wrote:
> Subject: Re: Analog clock
> From: Bob Smith <bobsmith5@home.com>
> Date: Mon, 11 Dec 2000 15:48:40 -0500
> X-Message-Number: 3
>
> Ok this is a subject that I have given some considerable
> thought to.
> Starting from there I suggest stepper motors to drive the
> hands. One for the sweep second hand which could be
> programmed to advance the second in precise one second
> increments like those nice little quartz clocks that hang on
> every wall everywhere these days (but rarely run well for
> more that a few years, or alternately, to advance in small
> increments like some mechanical watches to give the
> appearance of a rapid tick rate.
>
> A second stepper to drive the minute hand. The hour hand to
> be geared to the minute hand in the conventional sense. The
> assembly to be driven by a MCU synchronized to GPS.
> A hole drilled in the periphery of one of the drive gears
> and a photo interrupter should suffice to keep the steppers
> in synchronization.
>
> A battery pack or perhaps one of the little baby UPS
> supplies so common today to keep the whole mess running
> during outages.
>
>   Bob Smith
>
> Dominic Wu wrote:
> >
> > Bob,
> >
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> > Pete --
> >
> > Please clarify what you mean by "Analog dial". Is it just
> > the style of the dial, or some constraint on the workings?
> >
> >   Thanks, Bob Smith
> >
> > ---
>

Good morning again,

Man. you guys are great. Lots of action on a pretty remote subject. Thanks for all the thoughts.

"Analog dial", to me it means, just a simple old fashioned clock face with hands, second, minute, and hour, as opposed to a digital display showing only numbers.

The UPS idea sounds interesting, why build some half way rig when a nice package can be had for probably less money.

I like the "stepper motor" approach, but for me, it might be a little too deep and involved. Admittedly, I am starting out with the super accurate GPS and

ending up with something a lot less sophisticated, the humble little quartz movement. In spite of this, I think it is a way for me to learn, and not take on too much to quickly.
        By the way, there are available, some very nice quartz movements, not the type found in the "everywhere" junk we see in the discount stores.

        Thanks again,
        Pete Warren
Keene, NH

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: tacgps digest: December 11, 2000

From: Bob Smith <bobsmith5@home.com>
Date: Tue, 12 Dec 2000 12:51:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124233-2000.12.12-12.03.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Pete --

I once saw a pendulum clock that was disciplined by a solenoid style electromagnet with its core attached to the pendulum. The electromagnet was "kicked" precisely once per second (the ideal timing being just as the pendulum swung through the down position and the core was in the center of the electromagnet. The idea was that if the pendulum got a bit "out of phase" with the "kick" the magnetic forces would accelerate or retard it a bit and keep it in lock step.

I have absolutely *no* idea where I saw that idea or when. Geriatric brain fade!

Stepper motors aren't really so hard to deal with. There are a number of special purpose integrated circuits designed to drive them and they are also easy to drive with small, low-cost microprocessors.

National Semiconductor is one possible source of special purpose ICs.

        Try http://www.national.com

  If you are brave enough to pursue the idea I may be able to help you identify some such parts and make some early design decisions. This would have to be on a strictly "time available" basis, of course.

I used to live in Nashua (old Sanders brat, circa 1968), and know the Keene area fairly well. I'm sorry I ever left that part of the world.

Oh, btw, if you have a deep interest in horology you need to check out the NAWCC, (National Association of Watch and Clock Collectors, Inc.) They have an extensive technical library and a large museum available to members.

        Try http://www.nawcc.org/

        Best wishes with this most interesting project.

        Bob Smith

Pete Warren wrote:
>
> TAPR Special Interest Group digest wrote:
>
> > TAPR Special Interest Group Digest for Monday, December 11, 2000.
> >
> > 1. Re: Analog clock
> > 2. Re: Analog clock
> > 3. Re: Analog clock

> >
> > --
> >
> > Subject: Re: Analog clock
> > From: Bob Smith <bobsmith5@home.com>
> > Date: Mon, 11 Dec 2000 10:19:15 -0500
> > X-Message-Number: 1
> >
> > Pete --
> >
> > Please clarify what you mean by "Analog dial". Is it just
> > the style of the dial, or some constraint on the workings?
> >
> >   Thanks, Bob Smith
> > Subject: Re: Analog clock
> > From: "Dominic Wu" <dwu@Swales.com>
> > Date: Mon, 11 Dec 2000 09:35:05 -0800
> > X-Message-Number: 2
> >
> > Bob,
> >
> > I think Pete means analog dials, with a mechanical (quartz) movement, driven
> > by GPS "pulses" to be super accurate as opposed to the likes of Rolex
> > watches that lose 30 seconds a month...
> > Pete --
> >
> > Please clarify what you mean by "Analog dial". Is it just
> > the style of the dial, or some constraint on the workings?
> >
> >   Thanks, Bob Smith
> >
> > Pete Warren wrote:
> > Subject: Re: Analog clock
> > From: Bob Smith <bobsmith5@home.com>
> > Date: Mon, 11 Dec 2000 15:48:40 -0500
> > X-Message-Number: 3
> >
> > Ok this is a subject that I have given some considerable
> > thought to.
> > Starting from there I suggest stepper motors to drive the
> > hands. One for the sweep second hand which could be
> > programmed to advance the second in precise one second
> > increments like those nice little quartz clocks that hang on
> > every wall everywhere these days (but rarely run well for
> > more that a few years, or alternately, to advance in small
> > increments like some mechanical watches to give the
> > appearance of a rapid tick rate.
> >
> > A second stepper to drive the minute hand. The hour hand to
> > be geared to the minute hand in the conventional sense. The
> > assembly to be driven by a MCU synchronized to GPS.
> > A hole drilled in the periphery of one of the drive gears
> > and a photo interrupter should suffice to keep the steppers
> > in synchronization.
> >
> > A battery pack or perhaps one of the little baby UPS
> > supplies so common today to keep the whole mess running
> > during outages.
> >
> >   Bob Smith
> >
> > Dominic Wu wrote:
> > > >
> > > > Bob,
> > > >
> > > > I think Pete means analog dials, with a mechanical (quartz) movement, driven
> > > > by GPS "pulses" to be super accurate as opposed to the likes of Rolex
> > > > watches that lose 30 seconds a month...
> > > >
> > > > Pete --
> > > >
> > > > Please clarify what you mean by "Analog dial". Is it just
> > > > the style of the dial, or some constraint on the workings?
> > > >
> > > >   Thanks, Bob Smith
> > > >
> > > > ---
> > >
>

> Good morning again,
>
> Man. you guys are great. Lots of action on a pretty remote subject.
> Thanks for all the thoughts.
>
> "Analog dial", to me it means, just a simple old fashioned clock face
> with hands, second, minute, and hour, as opposed to a digital display showing
> only numbers.
>
> The UPS idea sounds interesting, why build some half way rig when a nice
> package can be had for probably less money.
>
> I like the "stepper motor" approach, but for me, it might be a little too
> deep and involved. Admittedly, I am starting out with the super accurate GPS and
> ending up with something a lot less sophisticated, the humble little quartz
> movement. In spite of this, I think it is a way for me to learn, and not take on
> too much to quickly.
> By the way, there are available, some very nice quartz movements, not the
> type found in the "everywhere" junk we see in the discount stores.
>
> Thanks again,
> Pete Warren
> Keene, NH
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex
----
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia
23236+1004

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15. [tacgps] Re: Pendulum synchronisation

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Tue, 12 Dec 2000 10:34:47 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124240-2000.12.12-12.47.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Tue, 12 Dec 2000, Bob Smith wrote:

> I once saw a pendulum clock that was disciplined by a
> solenoid style electromagnet with its core attached to the
> pendulum. The electromagnet was "kicked" precisely once per
> second (the ideal timing being just as the pendulum swung
> through the down position and the core was in the center of
> the electromagnet. The idea was that if the pendulum got a
> bit "out of phase" with the "kick" the magnetic forces would
> accelerate or retard it a bit and keep it in lock step.

Dear Bob and others,

I am originally from Los Angeles and when I was young I was very impressed with the science demonstrations at the Griffith Observatory in the Hollywood Hills. Besides the Tesla Coil, the best exhibit was a HUGE pendulum hanging from the domed ceiling with a ball on the end that marked the time of day in the sand beneath it. The way that they kept this going was exactly as you described. In fact, they shut it off every night at closing and started it again in the morning. This was described in their monthly small magazine called the Griffith Observer sometime in the 1955-65 decade.

73s,

Jeffrey Pawlan, WA6KBL

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16. [tacgps] Re: tacgps digest: December 11, 2000

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Tue, 12 Dec 2000 11:34:43 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124257-2000.12.12-13.47.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> I once saw a pendulum clock that was disciplined by a
> solenoid style electromagnet with its core attached to the
> pendulum.
> ...

Bryan Mumford has some beautiful examples of this.
See http://bmumford.com/clocks/emindex.html for details.

> Stepper motors aren't really so hard to deal with. There
> are a number of special purpose integrated circuits designed
> to drive them and they are also easy to drive with small,
> low-cost microprocessors.
> ...

Since small quartz clock steppers have only one coil it
is quite possible the specialized ICs for traditional high
current multiple pole stepper motors are not actually
required.

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: tacgps digest: December 11, 2000

From: "Charles E. Heisler" <cheisler@cyberia.com>
Date: Tue, 12 Dec 2000 15:11:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124264-2000.12.12-14.24.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 12:51 PM 12/12/2000 -0500, you wrote:
>Pete --
>
>I once saw a pendulum clock that was disciplined by a
>solenoid style electromagnet with its core attached to the
>pendulum. The electromagnet was "kicked" precisely once per
>second (the ideal timing being just as the pendulum swung
>through the down position and the core was in the center of
>the electromagnet. The idea was that if the pendulum got a
>bit "out of phase" with the "kick" the magnetic forces would
>accelerate or retard it a bit and keep it in lock step.
>
>I have absolutely *no* idea where I saw that idea or when.
>Geriatric brain fade!
>
>Stepper motors aren't really so hard to deal with. There
>are a number of special purpose integrated circuits designed
>to drive them and they are also easy to drive with small,
>low-cost microprocessors.
>
>National Semiconductor is one possible source of special
>purpose ICs.
>
>   Try   http://www.national.com
>
>   If you are brave enough to pursue the idea I may be able
>to help you identify some such parts and make some early
>design decisions. This would have to be on a strictly "time
>available" basis, of course.
>
>I used to live in Nashua (old Sanders brat, circa 1968), and
>know the Keene area fairly well. I'm sorry I ever left that
>part of the world.
>
>Oh, btw, if you have a deep interest in horology you need to
>check out the NAWCC, (National Association of Watch and

>Clock Collectors, Inc.) They have an extensive technical
>library and a large museum available to members.
>
>   Try http://www.nawcc.org/
>
>   Best wishes with this most interesting project.
>
>   Bob Smith
         If I could make one small correction to Bob's last statement. I live
near the NAWCC Museum/Library/School complex located in
Columbia PA. of which I an a member. I just wanted to say the Museum
is open to the public (for a small charge). On display you will find various
time keeping devices that are disciplined by electric and electronic means.
Some are vary similar to the method Bob described above, and are running.

         -73- Charlie
            K3VDB

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18. [tacgps] RE: Analog clock

From: "Pete Prossen" <prossen@znet.com>
Date: Tue, 12 Dec 2000 19:32:10 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124324-2000.12.12-23.48.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If you'd like to add a WWVB receiver to your basement, I have one I'd like
to get out of mine. It's a True Time model with IRIG output and I think 1
kHz out. Includes an active antenna.

Pete Prossen
WA6ZUH

prossen@znet.com

----- Original Message -----
From: Flemming Larsen <flarsen@earthlink.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Monday, December 11, 2000 10:45 PM
Subject: [tacgps] RE: Analog clock

> All,
>
> Some years ago, Hewlett-Packard made a very handsome analog clock,
> driven (I believe) by a syncronous motor, at some frequency derived
> from a WWVB receiver.
>
> Come to think about it, I may still have one of those clocks in my
> basement (without the WWVB receiver).
>
> -- Flemming Larsen, KB6ADS
>
> >
>
>
>
> ---
> You are currently subscribed to tacgps as: PROSSEN@ZNET.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] Analog clcok project

From: Pete Warren <pete@tramat.com>
Date: Wed, 13 Dec 2000 08:00:03 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124361-2000.12.13-07.12.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Good morning,

        You guys are great, I have had many responses to my nutty
project of trying to build a GPS or WWVB controlled analog clock for my
clockmaking business.
        I sincerely appreciate all your input and ideas. It is beginning
to look like it might just be a viable project. Certainly, without your
help I would still be out in the cold here in New Hampshire.

        Thanks again for the help, keep the info coming.

        Regards,
        Pete
        Keene, NH

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20. [tacgps] RE: Analog clock

From: Wis Macomson <wis@easystreet.com>
Date: Wed, 13 Dec 2000 07:43:03 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124385-2000.12.13-09.55.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Is it working? How much would you ask for it?

-wis

--
Wis Macomson
wis@easystreet.com

Pete Prossen wrote:
>
> If you'd like to add a WWVB receiver to your basement, I have one I'd like
> to get out of mine. It's a True Time model with IRIG output and I think 1
> kHz out. Includes an active antenna.
>
> Pete Prossen
> WA6ZUH
>
> prossen@znet.com
>
> ----- Original Message -----
> From: Flemming Larsen <flarsen@earthlink.net>
> To: TAPR Special Interest Group <tacgps@lists.tapr.org>
> Sent: Monday, December 11, 2000 10:45 PM
> Subject: [tacgps] RE: Analog clock
>
> > All,
> >
> > Some years ago, Hewlett-Packard made a very handsome analog clock,
> > driven (I believe) by a syncronous motor, at some frequency derived
> > from a WWVB receiver.
> >
> > Come to think about it, I may still have one of those clocks in my
> > basement (without the WWVB receiver).
> >
> > -- Flemming Larsen, KB6ADS

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21. [tacgps] Re: Analog clock

From: "M.L. McCauley" <mtech@airmail.net>
Date: Sun, 10 Dec 2000 11:28:14 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124480-2000.12.13-22.39.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>   5.   Currently, I would like to work out a very accurate, analog
> dial clock, to be used in my shop as a "regulator". As well, it would
> have "customer appeal", that is, a clock that could be advertised as
> being linked to the GPS system, and therefore super accurate.

I've got the same project going. I want to drive an old Telechron motor
120VAC line powered clock with 60 Hz derived from GPS. There's what I have
whipped up:

1) Set up a PLL using a 4046 CMOS chip. The PLL runs at 120 Hz. The loop is
locked by:
    a) Dividing the 120 Hz down to 1 Hz using a Maxim ICM7250 (/60)
        which then feeds a single flip-flop (4013 CMOS, /2).
    b) Lock the resulting signal to the GPS 1 PPS output.
2) The output of the 4046 is a 120 Hz signal. Hook that to the other flip-
     flop in the 4013 package. You then have a 60 Hz 2 phase signal. You
     hook the second flip-flops outputs (Q and Qbar) up to the gates of two
     power FETS that can handle 20+ VDC at 2+ A.
3) Hook the plus side of a +12 VDC 1+A supply up to the CT of a
    24V center tapped transformer with a 120VAC primary.
2) The FETs alternately switch the outside legs of the 24V transformer to
     the common of the +12 supply.

What you see at the transformer primary is (about) 120volts at 60 Hz. The
waveform is nasty looking, but its zero crossings are VERY accurate and
NEVER drift. I my case, I need 2 watts to run my clock; this circuit will
provide at least 6.

Plug in the clock, set it, and let the good times roll.

I would refer you to Don Lancaster's book "The CMOS Cookbook". Given your
heavy technical background, if you give that one a good read you will be
able to build what I have described no problem. Cost of parts is $40-50.

Check out the Maxim web site; they will sample you a 7250 for nothing. A
4013 is $.50, power FETs $2.00 each, $5-10 for a 24 VAC CT transformer, a
12VDC 2A PS, a 5VDC 100mA PS for the CMOS, and a box.

The CMOS would run off the 12VDC, but that supply will have a lot of trash
on it from the inductive kicks from the FETs banging the transformer
secondary on and off. Plus, but running it on 5V you match the level of the
signal form the GPS, so you don't need to do any stuff to make those two
pieces talk to each other.

Any of the GPS "engines" that the other guys on the list can tell you about
in detail have a 1 PPS output. Also, the TAPR clock kit provides it. I have
that clock kit, which is where I am getting my 1 PPS.

If I were you, I would buy the TAPR kit, get it working hooked up to a
computer via RS232 (which is how it normally works; the 1PPS buffered
outputs on their board are "extra" signals for "user projects".

Write if you have any questions. I'll be out of town till WED, but I'll
write back then.

73,

Mike, WB5MYY
Dallas, TX

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22. [tacgps] RE: Analog clock

From: "Borcher, Dave (HT-EX)" <DBorcher@GI.com>
Date: Thu, 14 Dec 2000 00:45:09 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124485-2000.12.13-23.56.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

You have a WWVB receiver w/ stable timebase, I would like to talk to you.
I have some interferometry applications...

Dave Borcher K7NG
dborcher@gi.com

 -----Original Message-----
From: Pete Prossen [mailto:prossen@znet.com]
Sent: Tuesday, December 12, 2000 20:32
To: TAPR Special Interest Group
Subject: [tacgps] RE: Analog clock

If you'd like to add a WWVB receiver to your basement, I have one I'd like
to get out of mine. It's a True Time model with IRIG output and I think 1
kHz out. Includes an active antenna.

Pete Prossen
WA6ZUH

prossen@znet.com

----- Original Message -----
From: Flemming Larsen <flarsen@earthlink.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Monday, December 11, 2000 10:45 PM
Subject: [tacgps] RE: Analog clock

> All,
>
> Some years ago, Hewlett-Packard made a very handsome analog clock,
> driven (I believe) by a syncronous motor, at some frequency derived
> from a WWVB receiver.
>
> Come to think about it, I may still have one of those clocks in my
> basement (without the WWVB receiver).
>
> -- Flemming Larsen, KB6ADS
>
> >
>
>
>
> ---
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>

You are currently subscribed to tacgps as: DBORCHER@GI.COM
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23. [tacgps] Re: Analog clock

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Thu, 14 Dec 2000 02:23:22 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-124510-2000.12.14-01.37.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

As I get older, I have grown to think it is better to emulate hardware in
virtual reality.

If you really want an accurate (and cheap) analog Rolex watch, do 2 things
;<}

  (1) fetch http://www.winsite.com/info/pc/winnt/miscutil/rolex.zip

  (2) run an NTP client on the same computer.

73, Tom

P.S. Somewhere around here I have a different rolex.exe from the mid 80's
that ran on old MessDOS computers with a CGA screen, just in case someone
is interested.

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24. [tacgps] please help

From: "Miyuru Jayasinghe" <miyuru@fclanka.com>
Date: Tue, 26 Dec 2000 17:35:17 +0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-126296-2000.12.26-05.45.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In Http you get post and get method. In the post method , which means when you post something what are the data that goes from the client to the server, Are those data stored in a log file. If you take a password or a username , how can you get it ,How can i get extract data which is send to the browser through the post method.

please give some answers to the above question.

miyuru.

25. [tacgps] Re: please help

From: "W. D." <xyz@netins.net>
Date: Tue, 26 Dec 2000 12:02:39 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-126334-2000.12.26-12.14.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Perhaps try:
http://x30.deja.com/=dnc/[ST_rn=ps]/dnquery.xp?QRY=HTML+post+get+method+pass
word
news:alt.html
http://www.Google.com/search?q=HTML+post+get+method+password+%28tutorial+or+
beginner%29
http://www.Google.com/search?q=HTML+post+get+method+password&lr=&safe=off
http://search.metacrawler.com/crawler?general=HTML+post+get+method+password

At 17:35 12/26/2000 +0600, Miyuru Jayasinghe, wrote:
>>>>
In Http you get post and get method. In the post method...

Start Here to Find It Fast!© -> http://US-WebMasters.com/start.htm

---
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January 2001

Original source file: tacgps.0101
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0101

1. [tacgps] Happy UTC New Year

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Tue, 2 Jan 2001 05:39:10 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-127742-2001.01.02-07.52.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I put some lab photos from last night at:
    http://www.LeapSecond.com/pages/2001/

/tvb

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2. [tacgps] Change of EMAIL ADDRESS

From: "Doug McKinney" <mckinney@scruznet.com>
Date: Tue, 2 Jan 2001 10:21:28 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <admin@nic.scruz.net>
Message-ID: <LYR6754-127769-2001.01.02-12.37.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm shifting IPs from RedShift.com to Scruznet.com

My email for xxx@mt.to (where xxx are the various mail boxes) went through buoy@redshift.com, and my new
 email box is buoy@scruznet.com . xxx@mt.to will should now go to Scruznet.com. I will leave redshift
up for one month to help over come comlications.

For scruznet.com, please confirm! Provide any corrections to all parties listed.

Doug McKinney
(831)663-4999

3. [tacgps] Surplus GPS Receivers?

From: "Larry Kayser" <kayser@sympatico.ca>
Date: Wed, 17 Jan 2001 19:20:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-129954-2001.01.17-18.34.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Greetings:

Some of us working in LF would like to go coherent timing using GPS
receivers. Does anyone know of any surplus GPS OEM level units, must have 1
PPS outputs? I would need four of these units, all the same.....

Thanks for looking at this email

Larry
VA3LK

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4. [tacgps] RE: Surplus GPS Receivers?

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Thu, 18 Jan 2001 06:41:12 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130080-2001.01.18-06.56.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Timeline has surplus Rockwell Jupiter units for US $69 at
http://www.digisys.net/timeline/arrival.html.

> ----------
> From: Larry Kayser[SMTP:kayser@sympatico.ca]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, January 17, 2001 6:20 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Surplus GPS Receivers?
>
> Greetings:
>
> Some of us working in LF would like to go coherent timing using GPS
> receivers. Does anyone know of any surplus GPS OEM level units, must have
> 1
> PPS outputs? I would need four of these units, all the same.....
>
> Thanks for looking at this email
>
> Larry
> VA3LK
>
>
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

5. [tacgps] RE: Surplus GPS Receivers?

From: "Eric A. Cottrell" <eac@shore.net>
Date: Thu, 18 Jan 2001 20:57:07 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130181-2001.01.18-20.10.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> "Kirby, Brian" wrote:
>
> Timeline has surplus Rockwell Jupiter units for US $69 at
> http://www.digisys.net/timeline/arrival.html.

Thank You! Thank You! Thank You! Thank You! Thank You! Thank You! Thank You!

I called up this morning and ordered two GPS units as well as two 16x2
backlighted LCD displays for my trakbox (I burnt out the old one).

They ship a sheet showing the pinout and tell where you can download the other
information. Because I did the FAQ on the Tripmate (Rockwell Jupiter based)
I have the documentation already. I just hope these units have the later
firmware with the 1 PPS that follows UTC. I do not need a Totally Accurate
Clock. One millisecond or so error is good for my purposes [A Somewhat
Accurate Clock (SAC)].

So I am adding to my GPS collection: Garmin G10, 45, 12xl, Delorme Tripmate
and Earthmate, Rockwell 5 channel GPS PCMCIA Card.

73 Eric eac@shore.net WB1HBU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] RE: Surplus GPS Receivers?

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Thu, 18 Jan 2001 22:44:40 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130193-2001.01.18-22.57.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Eric -

Let us know what find of shape the Jupiters arrive in (new in bag or
returned/used units)
I might be able to use a couple for another project !

Greg
w9gb

----- Original Message -----

From: "Eric A. Cottrell" <eac@shore.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, January 18, 2001 7:57 PM
Subject: [tacgps] RE: Surplus GPS Receivers?

> > "Kirby, Brian" wrote:
> >
> > Timeline has surplus Rockwell Jupiter units for US $69 at
> > http://www.digisys.net/timeline/arrival.html.
>
>
> Thank You! Thank You! Thank You! Thank You! Thank You! Thank You! Thank
You!
>
> I called up this morning and ordered two GPS units as well as two 16x2
> backlighted LCD displays for my trakbox (I burnt out the old one).
>
> They ship a sheet showing the pinout and tell where you can download the
other
> information. Because I did the FAQ on the Tripmate (Rockwell Jupiter
based)
> I have the documentation already. I just hope these units have the later
> firmware with the 1 PPS that follows UTC. I do not need a Totally
Accurate
> Clock. One millisecond or so error is good for my purposes [A Somewhat
> Accurate Clock (SAC)].
>
> So I am adding to my GPS collection: Garmin G10, 45, 12xl, Delorme
Tripmate
> and Earthmate, Rockwell 5 channel GPS PCMCIA Card.
>
> 73 Eric eac@shore.net WB1HBU
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] RE: Surplus GPS Receivers?

From: "Eric A. Cottrell" <eac@shore.net>
Date: Fri, 19 Jan 2001 22:03:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130366-2001.01.19-21.17.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gregory Beat wrote:
>
> Eric -
>
> Let us know what find of shape the Jupiters arrive in (new in bag or
> returned/used units)
> I might be able to use a couple for another project !

Hello,

Well they are in a bag that is taped. They do not look like they are pulls
from equipment as the mounting holes are clean. These boards are small!

I have not powered one up yet as I need to build the interface board for
my 'SAC' project 8->.

They are TU30-D140 assemblies with a straight up OCX connector (same
connector as the Garmin 12xl). I have a garmin adapter I can used to
connect my external GPS antenna to it.

Prom has on it:

JUP8
V180
CFB5

I got them because I have the docs and wanted something cheap with a
basic 1 PPS on it. I can also compare this with the tripmate and see
where certain pins are (like the antenna power supply pin).

73 Eric eac@shore.net WB1HBU

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8. [tacgps] RE: Surplus GPS Receivers?

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 20 Jan 2001 07:03:05 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130401-2001.01.20-07.15.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Eric A. Cottrell" wrote:
>
> Gregory Beat wrote:
> >
> > Eric -
> >
> > Let us know what find of shape the Jupiters arrive in (new in bag or
> > returned/used units)
> > I might be able to use a couple for another project !
>
> Hello,
>
> Well they are in a bag that is taped. They do not look like they are pulls
> from equipment as the mounting holes are clean. These boards are small!
>
> I have not powered one up yet as I need to build the interface board for
> my 'SAC' project 8->.
>
> They are TU30-D140 assemblies with a straight up OCX connector (same
> connector as the Garmin 12xl). I have a garmin adapter I can used to
> connect my external GPS antenna to it.

FWIW, M/A-Com has/sells the OCX connectors and they're easy to crimp...
providing you haven't developed old-fart eyes, like I have. They're a
little pricey, at $10/connector, but I crimped a couple of hundred over
the last 5 years for various Cows In Space instances.

73,
Gerry n5jxs
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] RE: Surplus GPS Receivers?

From: "Eric A. Cottrell" <eac@shore.net>
Date: Sat, 20 Jan 2001 11:24:11 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130455-2001.01.20-10.37.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager N5JXS wrote:
> >
> > They are TU30-D140 assemblies with a straight up OCX connector (same
> > connector as the Garmin 12xl). I have a garmin adapter I can used to
> > connect my external GPS antenna to it.
>
> FWIW, M/A-Com has/sells the OCX connectors and they're easy to crimp...
> providing you haven't developed old-fart eyes, like I have. They're a
> little pricey, at $10/connector, but I crimped a couple of hundred over
> the last 5 years for various Cows In Space instances.

Hello,

I guess I got confused. The docs say the connector is an OSX connector
which I think is also called a MCX.

There is a 10 KHz output as well as a 1 PPS.

73 Eric eac@shore.net WB1HBU

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] RE: Surplus GPS Receivers?

From: "Eric A. Cottrell" <eac@shore.net>
Date: Sat, 20 Jan 2001 11:59:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130466-2001.01.20-11.13.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

Reading the specs I see the 1 PPS is synchronized to UTC within 1 microsecond.
There is also a 10 KHz signal synchronized with 1 PPS as well.

I remember the older firmware did not synchronize the 1 PPS with UTC. You
had to read the offset from the messages. I think these units have 1.80
firmware which has the 1 PPS to UTC synch.

If you use Rockwell protocol you can get pseudoranges and carrier phase
information. The Rockwell protocol has some interesting messages like
outputting position in ECEF format.

This url has the overview data sheet.

http://www.sander-electronic.de/jupi.pdf

This web page does not display well on my browser but there are three
links right at the bottom for zip files with Jupiter/Zodiac information.

http://www.kingnav.com/JupiterOEM.htm

It seems a place in the UK is also selling them for slightly more money
(58.86 pounds)

http://www.tdc.co.uk/gpswire/receiver/jupiter.htm

I will be powering the units up over the weekend and I hope to give a
further report by Monday. All board I/O is at 5 volt CMOS driver levels
so I need to get a I/O board built up.

73 Eric eac@shore.net WB1HBU

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11. [tacgps] RE: Surplus GPS Receivers?

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 20 Jan 2001 18:47:23 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130503-2001.01.20-19.00.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Eric A. Cottrell" wrote:
>
> Hello,
>
> Reading the specs I see the 1 PPS is synchronized to UTC within 1 microsecond.
> There is also a 10 KHz signal synchronized with 1 PPS as well.
>
> I remember the older firmware did not synchronize the 1 PPS with UTC. You
> had to read the offset from the messages. I think these units have 1.80
> firmware which has the 1 PPS to UTC synch.

This would make a neat follow-on to W3IWI's TAC. Depending, of course,
on receiver nose.

> If you use Rockwell protocol you can get pseudoranges and carrier phase
> information. The Rockwell protocol has some interesting messages like
> outputting position in ECEF format.

Motorola does that too. It can be useful. Now, however, I'm thinking

in terms of a real cheap single-freq geodetic receiver...

> I will be powering the units up over the weekend and I hope to give a
> further report by Monday. All board I/O is at 5 volt CMOS driver levels
> so I need to get a I/O board built up.

Thanks for the continuing updates!

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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12. [tacgps] Rockwell Jupiter GPS Boards (was Sir+ GPS Receivers)

From: "Eric A. Cottrell" <eac@shore.net>
Date: Sun, 21 Jan 2001 17:34:10 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130619-2001.01.21-16.47.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

Well first off the twenty pin connector is not on .1 inch centers so I cannot
use a regular 20 pin IDC. They are on 2.0 mm centers.

I have not powered the boards up yet but I am starting to build the I/O board.
I am going to use a max232a for serial comms.

73 Eric eac@shore.net WB1HBU

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13. [tacgps] Re: Rockwell Jupiter GPS Boards (was Sir+ GPS Receivers)

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 21 Jan 2001 17:52:08 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130625-2001.01.21-18.04.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Eric A. Cottrell" wrote:
>
> Hello,
>
> Well first off the twenty pin connector is not on .1 inch centers so I cannot
> use a regular 20 pin IDC. They are on 2.0 mm centers.

(Quote) "The *OTHER* standard IDC connector!" (Unquote)

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: Rockwell Jupiter GPS Boards (was Sir+ GPS Receivers)

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Sun, 21 Jan 2001 20:42:51 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130648-2001.01.21-20.56.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just finished building up John Hansen's KISS modem from the November QST,

Config menu came up first time (also the first time that I used a magnifying

light to assemble
a PC board). The Jupiter GPS may be a useful engine for interfacing.

Greg
w9gb

----- Original Message -----
From: "Eric A. Cottrell" <eac@shore.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, January 21, 2001 4:34 PM
Subject: [tacgps] Rockwell Jupiter GPS Boards (was Sir+ GPS Receivers)

> Hello,
>
> Well first off the twenty pin connector is not on .1 inch centers so I
cannot
> use a regular 20 pin IDC. They are on 2.0 mm centers.
>
> I have not powered the boards up yet but I am starting to build the I/O
board.
> I am going to use a max232a for serial comms.
>
> 73 Eric eac@shore.net WB1HBU
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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15. [tacgps] Jupiter differential phase post-processing

From: Tom Willems <Tom.Willems@RUG.AC.BE>
Date: Mon, 22 Jan 2001 13:21:13 +0100 (MET)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130698-2001.01.22-06.34.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear friends,

I am very happy that the idea of a 'cheap single-freq geodetic receiver'
came up in the context of the Jupiter Zodiac.

There has been some discussion about this on the tacgps list before but,
at that time, with regard to the Motorola Oncore VPZ (the VP with carrier
phase option). Discussion about the interpretation of the VPZ carrier
phase data seems to have died out. Since the Oncore VP was discontinued, I
guess no one is interested in this any more .. ?

Concerning the Jupiter, the 'Serial IO Spec' (Sep.1996) document describes
two messages which contain pseudorange and carrier phase information:
message #1007 and #1102.
Not much detail is given on the specific meaning of each of the three
fields related to carrier phase in message #1007.
Message #1102 does seem straightforward.

According to a table in the 'Designer's Guide' (Dec.1996), which also
appears in the 'Labmon Operation Guide' (Jul.1996), the Labmon controller
software extracts carrier phase information from #1102.

It is not clear to me which versions support the #1102 message.
The jp_221.pdf (Dec.1997) and jup.pdf (Sep.1998) datasheet do not list
#1007 or #1102.
Datasheet 100888A.pdf (Mar.2000) does list #1007 but not #1102.
The Mar.2000 datasheet does list a number of new messages, which are
probably explained in a more recent 'Serial IO Spec' or 'Designer's
Guide'.

A webpage with detailed results of experiments with the Jupiter is
Sam Storm van Leeuwen's page at
http://home-2.worldonline.nl/~samsvl/juptest.htm
which also points out that ambiguity resolution may be impossible with the
Jupiter, unfortunately.

I think I will continue to mess around with the Motorola Oncore VPZ
myself, hoping it never breaks down...

73,
-Tom

Tom Willems
Ghent University
Department of Applied Mathematics and Computer Science
Krijgslaan 281/S9, B-9000 Gent, BELGIUM
Tel: +32-9-2644883, Secretariat: 2644757
Fax: 2644995, Tom.Willems@RUG.AC.BE

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: Jupiter differential phase post-processing

From: "Eric A. Cottrell" <eac@shore.net>
Date: Mon, 22 Jan 2001 08:43:31 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130708-2001.01.22-07.57.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

There has been upgrades to the receiver over time. I (or someone else) can
check the messages supported once I get it setup. I do have a copy of Labmon.

Tom Willems wrote:
> A webpage with detailed results of experiments with the Jupiter is
> Sam Storm van Leeuwen's page at
> http://home-2.worldonline.nl/~samsvl/juptest.htm
> which also points out that ambiguity resolution may be impossible with the
> Jupiter, unfortunately.

He does not mention if he turned position pinning off. There are a few
receiver settings that could change the filtering. Maybe it is time
to dust off and finish my RockComm program as Rockwell format is alot more
interesting than NMEA.

It may not be as good as a OnCore but for my purposes it is good enough.
I hope one of the GPS 'heavyweights' gets a chance to put the Jupiter
through it's paces like the other receivers so we can see how bad it is.
It would be interesting if the Jupiter turns out better than the M12.

73 Eric eac@shore.net WB1HBU

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17. [tacgps] Re: Rockwell Jupiter GPS Boards (was Sir+ GPS Receivers)

From: "Eric A. Cottrell" <eac@shore.net>
Date: Mon, 22 Jan 2001 20:30:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-130801-2001.01.22-19.44.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

Well I ordered connectors and cable for the Rockwell Jupiter boards.

I had to order 100 feet of 20 conductor 1 mm cable so anyone who is
looking for cable for their Rockwell Board contact me and I will ship
out some cable for cost plus shipping.

73 Eric eac@shore.net WB1HBU

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18. [tacgps] Rockwell Jupiter Boards

From: "Eric A. Cottrell" <eac@shore.net>
Date: Fri, 26 Jan 2001 09:25:48 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131301-2001.01.26-08.39.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

Well I got the two boards up and running.

A minor problem was getting 2mm 'the other standard' connectors and cable.
It does make for smaller cables.

I am currently using a Radio shack breadboard with a heatsinked 7805
regulator. I got two .1 uf caps, one from the input to ground, the other
from the output to ground. I also used a 100uf 16v electrolytic cap on
the output. These may not be the best components but they were in the
junkbox.

I bought a couple of MAX233A chips for another project so I used one.
They do not require any external caps for the charge pump. I used the
chip for serial comms and put the 1 PPS on the second RS232 transmit
driver. There is a spare RS232 receiver for RTCM input. The final
component is a 10k resistor to pull up the reset line although a suspect
alot of these line already have pull-ups on the jupiter board.

This circuit works and both boards work. They have the 1108 and 1102
messages and I can get out the pseudoranges and range rates(the program I
have does not display carrier phase, etc). I also did a quick check
by tuning in CHU Canada and powering up the GPS so it's 1 PPS is far
off from UTC. I watched the 1PPS on a scope. When the GPS started
navigating the 1 PPS changed to match the CHU signal. I do not have the
equipment to do real precision tests.

Previously I was able to locate the 1 PPS pin off the Tripmate (it is
unbuffered and does not go anywhere. The problem with the Tripmate
is earlier firmware is used and it does not have the 1108 message.
It also does not synchronize the 1PPS to UTC. I want to test the
Earthmate and see if there is later firmware. I suspect that the
Earthmate uses Rockwell protocol. So these Jupiter boards will be
useful for my purposes.

The Rockwell protocol is another minor problem. It is robust and
apparently used in their military receivers so it is complex 8->.
I started to write a program to communicate with it years ago.
Maybe I should pick it up again.

For best performance the Rockwell protocol is needed. It was previously
mentioned of some tests with a Jupiter board. On some of the tests
it would be better to turn off the position pinning and ground track
smoothing. There are a number of settings the user can change only in
Rockwell Protocol.

I will leave it for the real experts to look at the Jupiter to see how useful
it is for timing or possible DGPS work.

73 Eric eac@shore.net WB1HBU

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19. [tacgps] Rockwell Jupiter and Earthmate

From: "Eric A. Cottrell" <eac@shore.net>
Date: Sat, 27 Jan 2001 20:27:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131524-2001.01.27-19.41.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

I was running the receivers some more today.

I wanted to get ECEF output but it does not seem to output. It gets outputed
in polar regions perhaps? Both the Jupiter and Earthmate do the same.

I hooked up the Delorme Earthmate and it is Rockwell Binary. It outputs
EARTHA and you have to send it EARTHA for it to output (like the Tripmate).

Software Version is 1.98 (later than the Jupiter). What is interesting is
the protocol command does not work as well as the 1108 message (UTC timemark).
The message to enable output is acknowledged but no output. So it appears
the software is modified more or perhaps the messages got superseded.
The message for carrier phases, pseudoranges, etc does work. I may open up
the Earthmate and see if the 1 PPS follows UTC.

If you do a Google search for Rockwell LabMon you can find a program that
can read the rockwell binary. I use version 4.7 but it does not do baud
rates above 19200. Version 5.0 corrects the problem but turns off the
messages for carrier phases, pseudoranges, etc and can not display them.

I am working on some GPS problems at work and got to use the Trimble
Monitor program for the new Accutime 2000. One feature I like which I may
implement in my program is the setting dialogs have combo boxes or edit
boxes get initalized to the current values of the receiver. It sends a
message to read the values and uses the results to initalize the dialog.

I also noticed there are single board computers with a connector for a
Rockwell Jupiter board. They appear to be for industrial applications.

73 Eric eac@shore.net WB1HBU

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20. [tacgps] Re: Rockwell Jupiter and Earthmate

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sat, 27 Jan 2001 20:27:18 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131533-2001.01.27-20.40.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Eric A. Cottrell" wrote:
>
> Hello,
>
> I was running the receivers some more today.
>
> I wanted to get ECEF output but it does not seem to output. It gets outputed
> in polar regions perhaps? Both the Jupiter and Earthmate do the same.
>
> I hooked up the Delorme Earthmate and it is Rockwell Binary. It outputs
> EARTHA and you have to send it EARTHA for it to output (like the Tripmate).
> Software Version is 1.98 (later than the Jupiter). What is interesting is
> the protocol command does not work as well as the 1108 message (UTC timemark).
> The message to enable output is acknowledged but no output. So it appears
> the software is modified more or perhaps the messages got superseded.
> The message for carrier phases, pseudoranges, etc does work. I may open up
> the Earthmate and see if the 1 PPS follows UTC.
>
> If you do a Google search for Rockwell LabMon you can find a program that
> can read the rockwell binary. I use version 4.7 but it does not do baud
> rates above 19200. Version 5.0 corrects the problem but turns off the
> messages for carrier phases, pseudoranges, etc and can not display them.
>
> I am working on some GPS problems at work and got to use the Trimble
> Monitor program for the new Accutime 2000. One feature I like which I may
> implement in my program is the setting dialogs have combo boxes or edit
> boxes get initalized to the current values of the receiver. It sends a
> message to read the values and uses the results to initalize the dialog.
>
> I also noticed there are single board computers with a connector for a
> Rockwell Jupiter board. They appear to be for industrial applications.

FWIW, DeLorme and Rockwell contacts have told me the EarthMate is a
later-model Jupiter chipset with some Delorme-specific mods. Such as no
NMEA. At the time I didn't drill deeper, but some work a friend in the
Federal Govt has done with the Earthmate for geodesy has made it
intersting again.

I did some pretty extensive (help me Lord!) VB programming back some
years ago for the Motorola VP OnCore. I suspect I can ressurrect some
of that and mod it for the Jupiter. I'll see if I can find a Windoze
box.

Thanks for the flow of good info.

Gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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21. [tacgps] Re: Rockwell Jupiter and Earthmate

From: "Eric A. Cottrell" <eac@shore.net>
Date: Sat, 27 Jan 2001 23:18:15 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131535-2001.01.27-22.32.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager n5jxs wrote:
>
> FWIW, DeLorme and Rockwell contacts have told me the EarthMate is a
> later-model Jupiter chipset with some Delorme-specific mods. Such as no
> NMEA. At the time I didn't drill deeper, but some work a friend in the
> Federal Govt has done with the Earthmate for geodesy has made it
> intersting again.

That does sound interesting. I should open up the Earthmate and see what
it has in it. It would be neat if it can output 1PPS out the serial port
but it would require some additional wiring and likely a RS-232 driver.

Is it possible to upgrade the firmware on the Jupiter board? Is 1.80
a good firmware version or would later ones be better?

I suppose it would be alot easier to use a Jupiter board rather than
modifying an Earthmate.

>
> I did some pretty extensive (help me Lord!) VB programming back some
> years ago for the Motorola VP OnCore. I suspect I can ressurrect some
> of that and mod it for the Jupiter. I'll see if I can find a Windoze
> box.

Well it may not be as good as the VP OnCore but it is cheaper 8->. I
am really glad someone pointed out the Jupiter boards are available as
I was looking for one.

> Thanks for the flow of good info.

You are welcome. I hope it is useful to other people who want to get these
boards.

73 Eric eac@shore.net WB1HBU

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22. [tacgps] Laipac TF10 - GPS OEM Receiver

From: Alberto di Bene <dibene@usa.net>
Date: Sun, 28 Jan 2001 17:51:59 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131604-2001.01.28-11.07.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,
        in my quest for an inexpensive, though good quality
(how's that for an oxymoron?) OEM GPS unit for a TAC project,
I have been proposed the Laipac TF10 - GPS OEM unit.

I'd like to ask a couple questions :

1) What is the general consensus about the quality of this unit?
2) Reading the specs, I see this

     1 PPS Pulse   -   Aligned to GPS second, +/- 1 usec

     what is the exact meaning of that +/- 1 usec? I hope it's not
     a measure of jitter, otherwise it would be very bad.

Thanks for any answer

Alberto   I2PHD

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23. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Mon, 29 Jan 2001 01:46:09 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131694-2001.01.29-01.58.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Alberto di Bene wrote:
>
> Hi all,
>   in my quest for an inexpensive, though good quality
> (how's that for an oxymoron?) OEM GPS unit for a TAC project,
> I have been proposed the Laipac TF10 - GPS OEM unit.
>
> I'd like to ask a couple questions :
>
> 1) What is the general consensus about the quality of this unit?
> 2) Reading the specs, I see this
>
>   1 PPS Pulse   -   Aligned to GPS second, +/- 1 usec
>
>   what is the exact meaning of that +/- 1 usec? I hope it's not
>   a measure of jitter, otherwise it would be very bad.

According to the data on the web site, the receivers are based on SiRF
technology, which is a pretty fair pedigree. While the 1us jitter
appears excessive, perhaps it's not as bad as all that. I seem to
recall hearing about a timing app using these (SiRF) receivers that was
rivalling the OnCores, but I'm not sure where...

I'm interested in the TF30 for its WAAS and GLONAS capabilities...

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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24. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Mon, 29 Jan 2001 07:41:28 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131706-2001.01.29-06.55.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Monday, January 29, 2001 2:46 AM Gerry Creager n5jxs
[gerry@cs.tamu.edu] said:
> ... I seem to recall hearing about a timing app
> using these (SiRF) receivers that was rivalling
> the OnCores, but I'm not sure where...

A few experimental SiRFstar-I receivers were equipped with experimental
timing firmware. The test results showed the 1PPS far better than any
other receiver we had seen before, 5-10 times better than an Oncore VP
or UT+. For a copy of the paper or viewgraphs given at ION-2000 back in
September check out http://www.gpstime.com/. This is an ongoing project.
New SiRF firmware was released for testing this morning. Unfortunately,
this is not for sale at this time.

The 1PPS performance of a GPS receiver is determined primarily by two
things - the hardware capability of the receiver and the firmware. The
best hardware will still only provide roughly +-500nsec (half a

microsecond) performance with plenty of jitter if the firmware is
optimized only for navigation. The best firmware will be limited by the
clock speed of the CPU in setting the edges of the 1PPS, although this
can be removed through post processing of the "sawtooth correction"
data.

Rick
W2GPS

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25. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: Dr Thomas A Clark <clark@aleph.gsfc.nasa.gov>
Date: Mon, 29 Jan 2001 17:28:12 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Reza Abtahi <reza@cnst.com>, Rick Hambly <rick@cnssys.com>
Message-ID: <LYR6754-131750-2001.01.29-11.42.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry Creager n5jxs wrote:
>
> Alberto di Bene wrote:
> >
> > Hi all,
> >   in my quest for an inexpensive, though good quality
> > (how's that for an oxymoron?) OEM GPS unit for a TAC project,
> > I have been proposed the Laipac TF10 - GPS OEM unit.
> >
> > I'd like to ask a couple questions :
> >
> > 1) What is the general consensus about the quality of this unit?
> > 2) Reading the specs, I see this
> >
> >   1 PPS Pulse   -   Aligned to GPS second, +/- 1 usec
> >
> >   what is the exact meaning of that +/- 1 usec? I hope it's not
> >   a measure of jitter, otherwise it would be very bad.
>
> According to the data on the web site, the receivers are based on SiRF
> technology, which is a pretty fair pedigree. While the 1us jitter
> appears excessive, perhaps it's not as bad as all that. I seem to
> recall hearing about a timing app using these (SiRF) receivers that was
> rivalling the OnCores, but I'm not sure where...
>
> I'm interested in the TF30 for its WAAS and GLONAS capabilities...
>
> 73, gerry

Gerry -- I don't know anything about the Laipac receiver -- can you or
Alberto supply me with the URL that shows it?

Referring to SiRF activities, we are the folks responsible for the SiRF
timing results. The "we" in this case is me plus Rick(W2GPS) plus Reza
Abtahi. Our initial results were presented at last September's ION
meeting in Salt Lake and the "official" PDF'd paper is available on the
ION CD-ROM. Updated versions of the paper were also presented at the
Spetember IGS workshop, at the AMSAT meeting in Portland, and most
recently at the URSI meeting in Boulder. If you want the paper (and/or
the PPT presentation slides) and don't have access to the ION CD
proceedings, you can fetch them by clicking the buttons on

          http://gpstime.com

I must stress that the SiRF we are using is loaded with "private"
prototype R&D firmware (written by Reza) that is not (yet) commercially
available. [I also note that the same receiver makes an excellent
12-channel DGPS base station].

In that paper we show that with S/A off, we compare the performance of
the venerable old ONCORE VP with the new SiRF-based receiver. The ONCORE
shows short-term stability (i.e. under 5 minutes) of the 1PPS output at
~4 nsec RMS. With the prototype firmware, the SiRF receiver is better by
a factor of ~5 with RMS of < 700 psec. The paper also compares some of
the timing "glitches, bumps and grinds" that can make individual pulses
show errors of tens of nsec. When you looks at these plots, realize that
we have removed the "sawtooth" time quantization error from each counter

reading; the sawtooth results in the uncorrected 1PPS pulses being
uniformly distributed across a 104 nsec wide window for the ONCORE or a
26 nsec wide window for the SiRF. This results from the fact that the
actual pulses are generated from a ~9.5 MHz (Oncore) or ~38 MHz (SiRF)
internal clock.

Since the work reported in the paper on gpstime.com, I've continued to
compare the two receivers against our H-Maser reference clock. These
recent results are on my personal FTP site at

         ftp://tac.gsfc.nasa.gov/pub/gps/ggao/ for the ONCORE
and   ftp://tac.gsfc.nasa.gov/pub/gps/sirf/ for the SiRF prototype.

In these directories you will see similar timing plots for the Nov.23
thru Jan.01 period in the "xmas" plots (with higher numbers showing more
"zoom"). As usual, the BLUE trace is the timing averaged over 5 minutes,
with Red/Green being the extrema of the 1PPS signals in each 5 minute
bin. The Brown/Yellow trace at the bottom is the RMS of the 300 points
that were used to compute the 5 minute averages. The
"adev/tdev/tie/mtie" plots show the long-term Allan & Time deviation
plots and "tie/mtie" show the RMS and peak errors that would result in
measuring a long time interval. Finally "hist" shows a histogram of the
1 PPS pulses after a smooth drift has been removed.

Because of some subtleties in the timing firmware, the ONCORE is
corrected for the nsec portion of the UTC(USNO)-GPS time difference with
data broadcast by GPS in real-time, while the SiRF isn't. As a result,
I've spent quite a bit of time studying the UTC(USNO) vs GPS time
differences. You will see some of this work on my FTP site in the
directory

         ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/

where you will see the time history of the year 2000 daily corrections
and the differences between the broadcast and ex post facto corrections
in the utcgps plot. The daily corrections are developed at USNO based on
averages over 2 days of data and are posted 1 day late on the USNO web
site at

         ftp://tycho.usno.navy.mil/pub/gps/utcgps.dat (tabular)
or   http://tycho.usno.navy.mil/gif/utcgps.gif (plot)

The two "_av" plots show the Allan variances of the GPS constellation
used blindly as a clock (i.e. ignoring the utcgps.dat or real-time
corrections) in "utcgps_av" and the error that results if the predicted
(broadcast) corrections are applied in "utccor_av".

To anticipate two questions that may come up:

1. "No, I don't know if/when a SiRF receiver using this firmware will
    be available. I doubt that the firmware will be made available for
    loading into a gereic SiRF chipset receiver but (if there is enough
    of a market) it would be pre-loaded into a receiver. The Laipac
TF-10
    has not been discussed as a possible target to my knowledge."

2. "Yes, the UTC-GPS data only shows 30 days. But, with the help of the
    Lara Schmidt @ USNO, I have collected the entire data set from
    Jan.1, 2000 thru yesterday and it is available in
         ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/utcgps2000.txt"

73, Tom

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26. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: Dr Thomas A Clark <clark@aleph.gsfc.nasa.gov>
Date: Mon, 29 Jan 2001 18:55:35 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Reza Abtahi <reza@cnst.com>, Rick Hambly <rick@cnssys.com>
Message-ID: <LYR6754-131759-2001.01.29-13.09.19--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Gerry supplied me with the Laipac URL:

    http://www.laipac.com/msg4.htm

>From the material on this site, the TF10 receiver appears to be the
generic 5V "high power" version of the Taiwan clone of the SiRF
benchmark design. It appears to be quite similar to the SiRFSTAR-1
versions that we have been using for our testing. The 5V "high power"
version is needed in our application because the special timing code
clocks the microprocessor at a higher-than-normal speed, not possible
with the 3.3V version.

Laipac shows a qty=1 price of $79 US. I have seen a qty=1 price of $70
FOB Taiwan so it looks about right. Their $199 (with rcvr + antenna)
TF-Star I Development Kit is different from the test jig we are using,
but it looks interesting. Their $20 MagMount amplified antenna looks
like a good deal too.

The 20-pin power+I/O connector/cable used by this receiver is the same
2mm IDC (not 0.050"!) part that Eric and we have been having problems
finding. If anyone knows of a supplier of 2mm IDC widgets in small
quantity, please speak up!

73, Tom

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27. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: Bob Smith <bobsmith5@home.com>
Date: Mon, 29 Jan 2001 14:30:20 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131765-2001.01.29-13.44.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom --

I keep seeing a lot of fuss about 2mm IDC connectors. Is
that not what is shown under the AMP brand name on Page 37
of the current DigiKey catalog (# Q001)?? Am I missing
something here??

        73, de bob, wa4ypv

Dr Thomas A Clark wrote:
>
> Gerry supplied me with the Laipac URL:
>
>   http://www.laipac.com/msg4.htm
>
> >From the material on this site, the TF10 receiver appears to be the
> generic 5V "high power" version of the Taiwan clone of the SiRF
> benchmark design. It appears to be quite similar to the SiRFSTAR-1
> versions that we have been using for our testing. The 5V "high power"
> version is needed in our application because the special timing code
> clocks the microprocessor at a higher-than-normal speed, not possible
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> like a good deal too.
>
> The 20-pin power+I/O connector/cable used by this receiver is the same
> 2mm IDC (not 0.050"!) part that Eric and we have been having problems
> finding. If anyone knows of a supplier of 2mm IDC widgets in small
> quantity, please speak up!
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

```
---------  Avoid computer viruses  --  Practice safe hex
-------------
 * * Specializing in small, cost effective embedded control
systems * *
Robert L. (Bob) Smith                   Smith Machine Works, Inc.
internet   bobsmith5@home.com           9900 Lumlay Road
landline   804/745-1065                 Richmond, Virginia
23236+1004

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```

28. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

```
From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Mon, 29 Jan 2001 19:30:34 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131828-2001.01.29-19.44.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
Here is the 2 mm page on DigiKey's web site

http://rocky.digikey.com/USCatalog/V2/044.PDF

I see your problem Tom. the 3M cable looks like 40 conductor smallest width.
My X-Acto surgery method will likely work  ... very carefully (straightedge
would help)
slice ribbon down the middle and you get 2 , 20 conductor 2 mm cables.

Now which 2 mm IDC connector did you need?

My PanaVise handles compression of IDC.

Greg
w9gb

----- Original Message -----
From: "Dr Thomas A Clark" <clark@aleph.gsfc.nasa.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "Reza Abtahi" <reza@cnst.com>; "Rick Hambly" <rick@cnssys.com>
Sent: Monday, January 29, 2001 12:55 PM
Subject: [tacgps] Re: Laipac TF10 - GPS OEM Receiver


> Gerry supplied me with the Laipac URL:
>
>     http://www.laipac.com/msg4.htm
>
> From the material on this site, the TF10 receiver appears to be the
> generic 5V "high power" version of the Taiwan clone of the SiRF
> benchmark design. It appears to be quite similar to the SiRFSTAR-1
> versions that we have been using for our testing. The 5V "high power"
> version is needed in our application because the special timing code
> clocks the microprocessor at a higher-than-normal speed, not possible
> with the 3.3V version.
>
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> TF-Star I Development Kit is different from the test jig we are using,
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> like a good deal too.
>
> The 20-pin power+I/O connector/cable used by this receiver is the same
> 2mm IDC (not 0.050"!) part that Eric and we have been having problems
> finding. If anyone knows of a supplier of 2mm IDC widgets in small
> quantity, please speak up!
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>



---
```

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29. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Gregory Beat" <gregory.beat@mediaone.net>
Date: Mon, 29 Jan 2001 19:40:49 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131829-2001.01.29-19.54.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob,

Well, the AMP ribbon (receptacle) connectors for a 20 conductor ribbon cable
are
not shown in the DigiKey catalog. Only 40(IDE) 44(FLOPPY) and 50(SCSI)
connectors.

The 20 position connector listed earlier is the individual crimp pin version
(not labor saving)

Greg

----- Original Message -----
From: "Bob Smith" <bobsmith5@home.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, January 29, 2001 1:30 PM
Subject: [tacgps] Re: Laipac TF10 - GPS OEM Receiver

> Tom --
>
> I keep seeing a lot of fuss about 2mm IDC connectors. Is
> that not what is shown under the AMP brand name on Page 37
> of the current DigiKey catalog (# Q001)?? Am I missing
> something here??
>
> 73, de bob, wa4ypv
>
>
> Dr Thomas A Clark wrote:
> >
> > Gerry supplied me with the Laipac URL:
> >
> >   http://www.laipac.com/msg4.htm
> >
> > >From the material on this site, the TF10 receiver appears to be the
> > generic 5V "high power" version of the Taiwan clone of the SiRF
> > benchmark design. It appears to be quite similar to the SiRFSTAR-1
> > versions that we have been using for our testing. The 5V "high power"
> > version is needed in our application because the special timing code
> > clocks the microprocessor at a higher-than-normal speed, not possible
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> >
> > Laipac shows a qty=1 price of $79 US. I have seen a qty=1 price of $70
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> >
> > 73, Tom
> >
> > ---
> > You are currently subscribed to tacgps as: bobsmith5@home.com
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> --
>
> --------- Avoid computer viruses -- Practice safe hex
> -------------
> * * Specializing in small, cost effective embedded control
> systems * *
> Robert L. (Bob) Smith Smith Machine Works, Inc.
> internet   bobsmith5@home.com 9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia

> 23236+1004
>
> ---
> You are currently subscribed to tacgps as: GREGORY.BEAT@MEDIAONE.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

30. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Eric A. Cottrell" <eac@shore.net>
Date: Mon, 29 Jan 2001 20:54:48 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131830-2001.01.29-20.08.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dr Thomas A Clark wrote:
>
> The 20-pin power+I/O connector/cable used by this receiver is the same
> 2mm IDC (not 0.050"!) part that Eric and we have been having problems
> finding. If anyone knows of a supplier of 2mm IDC widgets in small
> quantity, please speak up!

Hello,

I dealt with Newark Electronics. I got the last 100' roll of 20 conductor
1mm cable but I am sure they have 2mm connectors. I got four but really only
need two.

The connectors and the cable are made by Berg and I had to search abit in the
catalog to find them. Newark's web page does not seem to search by
description and I do not have the part numbers handy.

I wonder if SiRF copied the pinout of the Jupiter.

The 1 microsecond spec seems the same as the Jupiter. I know Tom dismissed
the Rockwell stuff because the early versions did not synchronize the 1 PPS.
I wonder how good the later versions are.

73 Eric eac@shore.net WB1HBU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 30 Jan 2001 00:35:49 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131881-2001.01.30-00.50.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The tac.gsfc.nasa.gov links are not working.......

> ----------
> From: Dr Thomas A Clark[SMTP:clark@aleph.gsfc.nasa.gov]
> Reply To: TAPR Special Interest Group
> Sent: Monday, January 29, 2001 11:28 AM
> To: TAPR Special Interest Group
> Cc: Reza Abtahi; Rick Hambly
> Subject: [tacgps] Re: Laipac TF10 - GPS OEM Receiver
>
>
>
> Gerry Creager n5jxs wrote:
> >
> > Alberto di Bene wrote:
> > >
> > > Hi all,
> > >   in my quest for an inexpensive, though good quality
> > > (how's that for an oxymoron?) OEM GPS unit for a TAC project,
> > > I have been proposed the Laipac TF10 - GPS OEM unit.
> > >

> > > I'd like to ask a couple questions :
> > >
> > > 1) What is the general consensus about the quality of this unit?
> > > 2) Reading the specs, I see this
> > >
> > >   1 PPS Pulse   -   Aligned to GPS second, +/- 1 usec
> > >
> > >   what is the exact meaning of that +/- 1 usec? I hope it's not
> > >   a measure of jitter, otherwise it would be very bad.
> >
> > According to the data on the web site, the receivers are based on SiRF
> > technology, which is a pretty fair pedigree. While the 1us jitter
> > appears excessive, perhaps it's not as bad as all that. I seem to
> > recall hearing about a timing app using these (SiRF) receivers that was
> > rivalling the OnCores, but I'm not sure where...
> >
> > I'm interested in the TF30 for its WAAS and GLONAS capabilities...
> >
> > 73, gerry
>
> Gerry -- I don't know anything about the Laipac receiver -- can you or
> Alberto supply me with the URL that shows it?
>
> Referring to SiRF activities, we are the folks responsible for the SiRF
> timing results. The "we" in this case is me plus Rick(W2GPS) plus Reza
> Abtahi. Our initial results were presented at last September's ION
> meeting in Salt Lake and the "official" PDF'd paper is available on the
> ION CD-ROM. Updated versions of the paper were also presented at the
> Spetember IGS workshop, at the AMSAT meeting in Portland, and most
> recently at the URSI meeting in Boulder. If you want the paper (and/or
> the PPT presentation slides) and don't have access to the ION CD
> proceedings, you can fetch them by clicking the buttons on
>
>   http://gpstime.com
>
> I must stress that the SiRF we are using is loaded with "private"
> prototype R&D firmware (written by Reza) that is not (yet) commercially
> available. [I also note that the same receiver makes an excellent
> 12-channel DGPS base station].
>
> In that paper we show that with S/A off, we compare the performance of
> the venerable old ONCORE VP with the new SiRF-based receiver. The ONCORE
> shows short-term stability (i.e. under 5 minutes) of the 1PPS output at
> ~4 nsec RMS. With the prototype firmware, the SiRF receiver is better by
> a factor of ~5 with RMS of < 700 psec. The paper also compares some of
> the timing "glitches, bumps and grinds" that can make individual pulses
> show errors of tens of nsec. When you looks at these plots, realize that
> we have removed the "sawtooth" time quantization error from each counter
> reading; the sawtooth results in the uncorrected 1PPS pulses being
> uniformly distributed across a 104 nsec wide window for the ONCORE or a
> 26 nsec wide window for the SiRF. This results from the fact that the
> actual pulses are generated from a ~9.5 MHz (Oncore) or ~38 MHz (SiRF)
> internal clock.
>
>
> Since the work reported in the paper on gpstime.com, I've continued to
> compare the two receivers against our H-Maser reference clock. These
> recent results are on my personal FTP site at
>
>   ftp://tac.gsfc.nasa.gov/pub/gps/ggao/ for the ONCORE
> and   ftp://tac.gsfc.nasa.gov/pub/gps/sirf/ for the SiRF prototype.
>
> In these directories you will see similar timing plots for the Nov.23
> thru Jan.01 period in the "xmas" plots (with higher numbers showing more
> "zoom"). As usual, the BLUE trace is the timing averaged over 5 minutes,
> with Red/Green being the extrema of the 1PPS signals in each 5 minute
> bin. The Brown/Yellow trace at the bottom is the RMS of the 300 points
> that were used to compute the 5 minute averages. The
> "adev/tdev/tie/mtie" plots show the long-term Allan & Time deviation
> plots and "tie/mtie" show the RMS and peak errors that would result in
> measuring a long time interval. Finally "hist" shows a histogram of the
> 1 PPS pulses after a smooth drift has been removed.
>
> Because of some subtleties in the timing firmware, the ONCORE is
> corrected for the nsec portion of the UTC(USNO)-GPS time difference with
> data broadcast by GPS in real-time, while the SiRF isn't. As a result,
> I've spent quite a bit of time studying the UTC(USNO) vs GPS time
> differences. You will see some of this work on my FTP site in the
> directory

>
>   ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/
>
> where you will see the time history of the year 2000 daily corrections
> and the differences between the broadcast and ex post facto corrections
> in the utcgps plot. The daily corrections are developed at USNO based on
> averages over 2 days of data and are posted 1 day late on the USNO web
> site at
>
>   ftp://tycho.usno.navy.mil/pub/gps/utcgps.dat (tabular)
> or   http://tycho.usno.navy.mil/gif/utcgps.gif (plot)
>
> The two "_av" plots show the Allan variances of the GPS constellation
> used blindly as a clock (i.e. ignoring the utcgps.dat or real-time
> corrections) in "utcgps_av" and the error that results if the predicted
> (broadcast) corrections are applied in "utccor_av".
>
>
>
> To anticipate two questions that may come up:
>
> 1. "No, I don't know if/when a SiRF receiver using this firmware will
>   be available. I doubt that the firmware will be made available for
>   loading into a gereic SiRF chipset receiver but (if there is enough
>   of a market) it would be pre-loaded into a receiver. The Laipac
> TF-10
>   has not been discussed as a possible target to my knowledge."
>
> 2. "Yes, the UTC-GPS data only shows 30 days. But, with the help of the
>   Lara Schmidt @ USNO, I have collected the entire data set from
>   Jan.1, 2000 thru yesterday and it is available in
>   ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/utcgps2000.txt"
>
>
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

32. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Tue, 30 Jan 2001 05:07:46 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131898-2001.01.30-04.21.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> "Kirby, Brian" wrote:
>
> The tac.gsfc.nasa.gov links are not working.......

They should work OK. /pub is the default directory.

For me using Netscape 4.76, clicking on the URL works fine. From
some FTP clients, just connect to tac.gsfc.nasa.gov which will put
you in /pub, then follow the links with "cd gps".

The machine is running a mini-firewall because NASA has had some
DOS (Denial Of Service) hacker problems. I think I have the filter
allow anonymous FTP but it might be it caught you.

Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: Laipac TF10 - GPS OEM Receiver

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 30 Jan 2001 06:08:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-131899-2001.01.30-05.22.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

RE: [tacgps] Re: Laipac TF10 - GPS OEM ReceiverRemove the "/pub" from the
middle of each link and they work fine.

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of Kirby, Brian
Sent: Tuesday, January 30, 2001 1:36 AM
To: TAPR Special Interest Group
Subject: [tacgps] Re: Laipac TF10 - GPS OEM Receiver

The tac.gsfc.nasa.gov links are not working.......

  From: Dr Thomas A Clark[SMTP:clark@aleph.gsfc.nasa.gov]
  Reply To: TAPR Special Interest Group
  Sent: Monday, January 29, 2001 11:28 AM
  To: TAPR Special Interest Group
  Cc: Reza Abtahi; Rick Hambly
  Subject: [tacgps] Re: Laipac TF10 - GPS OEM Receiver

  Gerry Creager n5jxs wrote:
  >
  > Alberto di Bene wrote:
  > >
  > > Hi all,
  > >   in my quest for an inexpensive, though good quality
  > > (how's that for an oxymoron?) OEM GPS unit for a TAC project,
  > > I have been proposed the Laipac TF10 - GPS OEM unit.
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  > > I'd like to ask a couple questions :
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  > >   a measure of jitter, otherwise it would be very bad.
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  > 73, gerry

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  ION CD-ROM. Updated versions of the paper were also presented at the
  Spetember IGS workshop, at the AMSAT meeting in Portland, and most
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  ~4 nsec RMS. With the prototype firmware, the SiRF receiver is better by
  a factor of ~5 with RMS of < 700 psec. The paper also compares some of
  the timing "glitches, bumps and grinds" that can make individual pulses

show errors of tens of nsec. When you looks at these plots, realize that we have removed the "sawtooth" time quantization error from each counter reading; the sawtooth results in the uncorrected 1PPS pulses being uniformly distributed across a 104 nsec wide window for the ONCORE or a 26 nsec wide window for the SiRF. This results from the fact that the actual pulses are generated from a ~9.5 MHz (Oncore) or ~38 MHz (SiRF) internal clock.

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ftp://tac.gsfc.nasa.gov/pub/gps/ggao/ for the ONCORE
and ftp://tac.gsfc.nasa.gov/pub/gps/sirf/ for the SiRF prototype.

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ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/

where you will see the time history of the year 2000 daily corrections and the differences between the broadcast and ex post facto corrections in the utcgps plot. The daily corrections are developed at USNO based on averages over 2 days of data and are posted 1 day late on the USNO web site at

ftp://tycho.usno.navy.mil/pub/gps/utcgps.dat (tabular)
or http://tycho.usno.navy.mil/gif/utcgps.gif (plot)

The two "_av" plots show the Allan variances of the GPS constellation used blindly as a clock (i.e. ignoring the utcgps.dat or real-time corrections) in "utcgps_av" and the error that results if the predicted (broadcast) corrections are applied in "utccor_av".

To anticipate two questions that may come up:

1. "No, I don't know if/when a SiRF receiver using this firmware will be available. I doubt that the firmware will be made available for loading into a gereic SiRF chipset receiver but (if there is enough of a market) it would be pre-loaded into a receiver. The Laipac TF-10 has not been discussed as a possible target to my knowledge."

2. "Yes, the UTC-GPS data only shows 30 days. But, with the help of the Lara Schmidt @ USNO, I have collected the entire data set from Jan.1, 2000 thru yesterday and it is available in ftp://tac.gsfc.nasa.gov/pub/gps/usno_gps/utcgps2000.txt"

73, Tom

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February 2001

Original source file: tacgps.0102
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0102

1. [tacgps] NASA Jobs

From: Pat Kilroy <pat.kilroy@gsfc.nasa.gov>
Date: Thu, 01 Feb 2001 17:53:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: sarex@amsat.org, tacgps@lists.tapr.org, rlindquist@arrl.org
Message-ID: <LYR6754-132380-2001.02.01-17.07.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

FYI

At this morning's Center-wide "All Hands Meeting" it was announced
that the hiring freeze at NASA Goddard will end soon. GSFC anticipates
"about 300 new hires this year" of engineers and scientists with "about
half of them to come in as [university] 'fresh outs'". Please pass
this on.

For mission-oriented prospects who'd like a picture of the types of
cool work we do here then check out these web sites ...

How NASA GSFC is organized http://www.gsfc.nasa.gov/gsfc/org/org.htm
Our Applied Engineering & Technology Directorate http://aetd.gsfc.nasa.gov/
Our Electrical Systems Center http://aetd.gsfc.nasa.gov/centers/es.html and
                               http://esc.gsfc.nasa.gov/index.htm
Some of our customers http://esc.gsfc.nasa.gov/projects_customers.htm
GSFC Products & Services Lookup http://this.gsfc.nasa.gov/pns/

NASA Jobs http://www.nasajobs.gov

Contact the people listed at these sites. I'm not an OHR person so
please refrain from contacting me. Good luck!

73 de Pat N8PK

==
Patrick L. Kilroy   WK
Integration & Test Lead Engineer PHONE: 301-286-1984
NASA Goddard Space Flight Center FAX: 301-286-1673
Building 5, Mail Code 568   E-MAIL: pat.kilroy@gsfc.nasa.gov
Greenbelt, Maryland 20771   WEB: http://simsat.gsfc.nasa.gov
==

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2. [tacgps] Re: NASA Jobs > Update to URL

From: Pat Kilroy <pat.kilroy@gsfc.nasa.gov>
Date: Thu, 01 Feb 2001 17:56:44 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: sarex@amsat.org, tacgps@lists.tapr.org, rlindquist@arrl.org
Message-ID: <LYR6754-132381-2001.02.01-17.10.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Oops. Sorry, that last URL should be

NASA Jobs
http://www.nasajobs.nasa.gov/

-PK

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] GPS Antennas

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Sat, 10 Feb 2001 15:56:17 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134328-2001.02.10-15.10.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Those of you who have an interest in precision GPS antennas might find a
paper by Schupler & Clark in the Feb.2001 GPS World, pages 48-55 of
interest. [In fact, you MUST find it of interest, since I'm one of the
authors.]

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] TAPR Press Release

From: John Ackermann N8UR <jra@febo.com>
Date: Sat, 10 Feb 2001 20:10:33 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: tapr-bb@lists.tapr.org, aprssig@lists.tapr.org, netsig@lists.tapr.org,
        bbssig@lists.tapr.org, picsig@lists.tapr.org, hfsig@lists.tapr.org,
        tacgps@lists.tapr.org, tapr-org@lists.tapr.org, htaprs@lists.tapr.org
Message-ID: <LYR6754-134368-2001.02.10-19.25.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

FOR IMMEDIATE RELEASE

February 10, 2001
TAPR APPOINTS NEW DIRECTORS, SECRETARY

Steve Stroh, N8GNJ, and Byon Garribrant, N6BG, have been appointed to the
TAPR Board of Directors, and Guy Story, KC5GOI, has been appointed the
organization's Secretary.

Steve Stroh is a long time member of TAPR. He lives in Woodinville,
Washington, a suburb of Seattle, where he is a member of the Puget Sound
Amateur Radio TCP/IP Group (also known as WetNET, the Washington
Experimenter's TCP/IP Group) and MicroHAMs, the Microsoft Amateur Radio
Club. Steve's major interests in Amateur Radio are digital modes and
advanced wireless networking. Steve has been the manager of TAPR's
"NetSig" special interest group for several years, and has also been active
in TAPR's spread spectrum SIG.

Steve was recently named Digital Editor for CQ Amateur Radio Magazine and
writes CQ's monthly Digital Wireless column. Professionally, he is a
full-time Independent Technology Writer, focusing on Broadband Wireless
Internet Access.

Steve will fill the remaining Board term of Greg Jones, WD5IVD, who
previously announced his desire to resign from his TAPR offices after many
years of service.

Byon Garribrant has been active in packet radio and transmitter hunting
since he was licensed in 1990. He served as the Digital Communications
Officer for Orange County RACES for 5 years, maintaining the group's packet
BBS, and organizing digital communication exercises using packet
message-passing software he created.

In 1998, Byon began actively working with TAPR as a member of the PIC-E
design team, and published the firmware used in the PIC-E. He has also
given presentations at the last three Digital Communication Conferences on
PIC programming. Byon has created several PIC-based amateur radio devices,
including the GST-1 and GST-2, which allow GPSs to be used with APRS, the
TinyTrak, an inexpensive TNC replacement for an APRS tracker, and PicCon, a
transmitter controller for T-Hunting. He sells these devices as kits from
his home business, Byonics. He lives in Las Vegas, Nevada, with his wife,
Lara, KD6AYO, and three children and works as a computer game programmer
for Westwood Studios.

Byon will fill the remaining Board term of Barry McLarnon, VE3JF, who
served TAPR as a Director and volunteer for many years. TAPR will miss
Barry's technical knowledge and true ham spirit.

Guy Story was first licensed in 1994 and has been an active packet radio
user since his first day as a ham. He operated a TCP/IP station using JNOS
before becoming active in APRS in early 1997, when he also joined TAPR. As

a TAPR member, he has been actively involved in the organization's APRS and spread spectrum activities. Guy is also the APRS Chairman and repeater control operator for the Denton County Amateur Radio Association and is an assistant emergency coordinator for Denton County ARES.

Guy lives in Denton, Texas and is an Electronics Technician in the area of EMC/EMI compliance for Interphase Corporation in Dallas.

Guy takes over as Secretary from Bob Hansen, N2GDE, who continues as a Director and as Editor of the Packet Status Register, TAPR's quarterly journal.

About TAPR
TAPR (officially, Tucson Amateur Packet Radio, Inc.) is a non-profit research and development corporation dedicated to advancing amateur radio through digital technology. It focuses on development of hardware and software tools that enable ham radio operators to explore leading edge technologies. Despite its name, TAPR is an international organization with over 2000 members worldwide.

Contact information:
Telephone: (940) 383-0000
Email: tapr@tapr.org
Web: http://www.tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: GPS Antennas

From: "Ira A. Wilner" <bdcst@sover.net>
Date: Sat, 10 Feb 2001 20:36:55 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134376-2001.02.10-19.51.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

I read the article the other day and was going to ask you if you had the opportunity to test any of your pie pan antennas in that test chamber?

Also, since then there have been a couple of new antennas on the market that claim to work better while being smaller and lighter than those older choke ring designs.

--Ira
////////////////////////////////
-----Original Message-----
From: Dr Thomas A Clark (W3IWI) <tac@clark.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Date: Saturday, February 10, 2001 8:13 PM
Subject: [tacgps] GPS Antennas

>Those of you who have an interest in precision GPS antennas might find a
>paper by Schupler & Clark in the Feb.2001 GPS World, pages 48-55 of
>interest. [In fact, you MUST find it of interest, since I'm one of the
>authors.]
>
>73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re: GPS Antennas

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sat, 10 Feb 2001 21:29:39 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134386-2001.02.10-21.42.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

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>
> Those of you who have an interest in precision GPS antennas might find a

> paper by Schupler & Clark in the Feb.2001 GPS World, pages 48-55 of
> interest. [In fact, you MUST find it of interest, since I'm one of the
> authors.]

Mine hasn't made the PO box at the office yet. I'll be looking.

I'm trying to get a height-mod paper together for ION/GPS... are you
returning to the scene of the fall this year?

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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7. [tacgps] Re: GPS Antennas

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Sat, 10 Feb 2001 23:38:07 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134389-2001.02.10-22.52.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Ira A. Wilner" wrote:
> I read the article the other day and was going to ask you if you had the
> opportunity to test any of your pie pan antennas in that test chamber?
>
> Also, since then there have been a couple of new antennas on the market
> that claim to work better while being smaller and lighter than those older
> choke ring designs.

My copy only arrived today here at home. It was pretty amazing -- Richard
Langley told us that he had edited down the ION paper in early January. It
was already inpress before I saw the edited copy. They sure work fast!

Yes, we've run patterns and phase center measurements on two different
iterations (an early 2 ring concept & the 3 ring version I described here
2+ years ago), both using the Motorola patch antenna as the core. Photos of
the home-brew antenna can be seen at URL
     ftp://aleph.gsfc.nasa.gov/GPS/antennas/
See especially choke_proto.jpg (the original 2-ring prototype),and for the
later design parts (the raw material), holes (after drilling all the
holes), and choke_asm (after pop-riveting the widgets together). Finally
tripod shows the assembled (and painted) antenna sitting on a surveying
tripod; this was before I added a plastic cake container as a radome.

Regarding the newer antenna types -- the paper has data on the Javad choke
ring. None of the other manufacturers have provided samples for testing and
we haven't been on the range for over a year.

Tom

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8. [tacgps] Re: GPS Antennas

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sun, 11 Feb 2001 00:11:05 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134413-2001.02.11-00.24.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Tom Clark (W3IWI)" wrote:
>
...
> Regarding the newer antenna types -- the paper has data on the Javad choke
> ring. None of the other manufacturers have provided samples for testing and
> we haven't been on the range for over a year.

I'm trying to dig up funding to develop an outdoor range here, n my
copious free time. That's been osmething I wanted to get going for
several years... I'll advise when I get something going. I have space,
now I have to get a portable building and pedistals built...

gerry

--
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9. [tacgps] Re: US$20 GPS - Report

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sun, 11 Feb 2001 16:43:09 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134506-2001.02.11-16.57.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This is the normal behavior. The receiver attempts to find the
constellation it last saw, using data on last position and the last
valid almanac. If you move a receiver some 1000-1500 miles, you need to
tell it to do a sky-search through whatever mechanism you normally would
use for these things, rather than waiting for it to time out.

Darryl Smith wrote:
>
> G'Day
>
> I was just in the USA for a couple of weeks doing some GPS work with the
> US$20 GPS units that many people bought surplus, and I have found an
> 'Interesting' feature that might lead to some trouble.
>
> These units will fail to lock onto GPS when you move them significant
> distances very quickly, such as when you fly one from Australia to the USA
> powered down, but with the battery backup attached. Quickly removing the
> battery backup with the unit powered down will reset the unit, allowing the
> GPS to seach the sky for satellites.
>
> I think that the way this unit works is that it assumes that cars do not
> drive 8,000 miles in 12 hours, and therefore is using all the computing
> power to search the sky where it thinks it is, rather than spending some
> time also searching for other satellites. This makes sense because the unit
> has very good performance in even areas where part of the sky is obscured,
> and re-acquired very quickly

gerry
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10. [tacgps] Re: GPS Antennas

From: Dave Martindale <davem@cs.ubc.ca>
Date: Sun, 11 Feb 2001 15:02:37 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134507-2001.02.11-17.16.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom Clark wrote:
>[If there is any real interest, I could explain why the reported number
>is S/(S+N) and not S and not S/N. It has to do with the way that the
>correlation is done in the silicon DSP "receivers" in a typical GPS box.]

I, for one, would be interested in hearing about this.

        Dave

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11. [tacgps] Re: GPS Antennas

From: Bob Bruninga <bruninga@usna.edu>
Date: Sun, 11 Feb 2001 11:46:46 -0500 (EST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134460-2001.02.11-11.01.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> "Tom Clark (W3IWI)" mentioned not being on the range for over a year...
Gerry said:
> I'm trying to dig up funding to develop an outdoor range here, n my
> copious free time. That's been osmething I wanted to get going for

Don't know if this applies, but to quote a famous ad: "You dont need no stinkin range!" <grin>

(For simple tests of course...)
Any GPS antenna in the clear, combined with the GPS constellation is a complete calibrated 1575 MHz range in itself. Just plot the AZ/EL and Signal strength of the NMEA output of any test antenna scaled to 1575 and over a few hours time, you will have received a calibrated 1575 MHz signal from just about all elevation angles.

To see an example, look at the plot way towards the bottom of this page:
http://web.usna.navy.mil/~bruninga/astars.html

My SIG-PLOT.BAS (included in all vesions of APRSdos) does this for two antenna simultaneousely. Feed one GPS to COM1 and the other to COM2. The result is a plot of both. Great for comparing a test antenna to a known one. (the example shown on the page is a 3/4 vs 1/4 vertical)

Tom has pointed out that the SIG Strength reported in the NMEA string is not absolute, but relative and so this technique is not good for absolute gain measurements, but it is perfect for seeing a RELATIVE Elevation angle plot for omni antennas.

This is mostly for vertical OMNI antennas since any azimuth can be used. But if you let it run for 24 hours or more to accumulate enough AZIMUTH signals to cover the whole sky, then it can also give an Azimuth plot.

Just a thought.
de WB4APR, Bob

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12. [tacgps] US$20 GPS - Report

From: "Darryl Smith" <darryl@radio-active.net.au>
Date: Mon, 12 Feb 2001 05:48:20 +1100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134469-2001.02.11-12.55.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

G'Day

I was just in the USA for a couple of weeks doing some GPS work with the US$20 GPS units that many people bought surplus, and I have found an 'Interesting' feature that might lead to some trouble.

These units will fail to lock onto GPS when you move them significant distances very quickly, such as when you fly one from Australia to the USA powered down, but with the battery backup attached. Quickly removing the battery backup with the unit powered down will reset the unit, allowing the GPS to seach the sky for satellites.

I think that the way this unit works is that it assumes that cars do not drive 8,000 miles in 12 hours, and therefore is using all the computing power to search the sky where it thinks it is, rather than spending some time also searching for other satellites. This makes sense because the unit has very good performance in even areas where part of the sky is obscured, and re-acquired very quickly

I hope this helps... It took me a few hours to work this one out sitting on the top level of the CNN buildings car park in Los Angeles waiting for the GPS to lock

Darryl

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

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13. [tacgps] Re: GPS Antennas

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Sun, 11 Feb 2001 17:01:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134497-2001.02.11-16.16.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob Bruninga wrote:

> (For simple tests of course...)
> Any GPS antenna in the clear, combined with the GPS constellation is a
> complete calibrated 1575 MHz range in itself. Just plot the AZ/EL and
> Signal strength of the NMEA output of any test antenna scaled to 1575
> and over a few hours time, you will have received a calibrated 1575 MHz
> signal from just about all elevation angles.

Your statement is somewhat true for relative antenna gain perfomance, but I disagree strongly with your use of "completely" and "calibrated". Here are some reasons:

1. Your scheme assumes that the NEMA message is a correct representation of S/(S+N). Experience has shown that it can be incorrect at levels of a few dB. [If there is any real interest, I could explain why the reported number is S/(S+N) and not S and not S/N. It has to do with the way that the correlation is done in the silicon DSP "receivers" in a typical GPS box.]

2. The NMEA parameter is quantized at levels of only 1 dB.

3. The reported parameter is S/(S+N). It is usually not correct to assume that the noise N is constant. N consists of: (a) a contrubution due to the receiver (the noise from the LNA, preamp in the antenna, coax losses, and the receiver itself), plus (b) the noise due to the fact that the antenna "sees" ground and other local QRN sources, plus (c) the GPS "self noise" (the total signal power contributed by all the GPS satellites in view).

While (a) may be constant, the local QRN contribution to (b) is variable. And most important, you need to perform the sum over the satellites that happen to be in view at a given time (weighted by the antenna gain in that direction) to account for (c).

4. You also need to account for the fact that the 1/r^2 satellite range changes with elevation; the zenith-to-horizon path loss amounts to a ~3 dB correction. To this should also be added the correction for the antenna pattern of the array of 8 helical antennas on the spacecraft.

5. The maximum dynamic range of GPS (the weakest-to-strongest S/(S+N) range that you can see) is only 20-25 dB, largely due to the fact that the spreading gain of the 1023 bit C/A code is only 30 dB.

6. Lumping all GPS satellies into one box is bad. The EIRP varies by several dB from satellite-to-satellie. The Block-IIF satellites are supposed to QRO by several more dB.

So I'd suggest that your scheme probably yields an accuracy in the 3-6 dB range. This gives only a crude indication of the gain. I hardly think is is "complete" or "calibrated"!

As a mini-tutorial, I'd like to expand on item 3 from my list by showing how it breaks down for the case of a high-gain antenna. Let's take the case of your 40' USNA antenna and suppose that you put a GPS feed on it. The antenna beamwidth would be about 1 degree (FWHM) and the gain would be around 33-34 dB. Assume that you have a pretty good LNA and this gives you a system temperature of ~100K. Experience shows that each GPS satellite adds about 20K of noise with a conventional antenna, so with 33 dB of gain,

the GPS satellite contributes about 40,000K on axis. It is very unlikely
that there are any more GPS satellites in the 1 degree beam. So we see

     S/(S+N) = 40,000/(40,000 + 100) = 0.9975 power ratio

I have no idea what the reported number in the NMEA message would be for
this extremely strong signal. But lets continue by assuming that it is some
constant plus a true measure of the (nearly unity) S/(S+N) expressed in dB
about something.

The object of the 40' thought experiment I propose is to measure the main
beam pattern. So you move the big antenna 1-2 degrees away, off the peak
of the main beam. ~1 degree off axis the signal drops ~6 dB so lets move a
bit more to the -10 dB point. We now have

     S/(S+N) = 4000/(4000+100) = 0.9756 power ratio

Now we note that a power drop from 0.9975 to 0.9756 represents a change in
the NMEA parameter of less than 0.1 dB. Even if you move further to the -20
db point, you still have:

     S/S+N = 400/(400+100) = 0.8

seen the parameter reported in the NMEA message drop by only 0.97 dB, and
that is still less that the quantization reported in the NMEA numbers!

What your scheme can do is to compare two antennas and follow a recipe
like:

    a. Plan to use a complete full day of data. This insures that
       you have a full repeat of the geometry in your observations.
    b. Assume that the antennas have azimuthal symmetry and forget
       trying to measure azimuth vartiations.
    c. Average the data into 0-90 elevation and 1-32 PRN bins in a 2-D
       array (You might want to use 5 degree elevation bins).
    d. Fit each satellite vs. elevation with a simple curve (gaussian
       or cosine^2 is probably good) to determine an average satellite-
       to-satellite signal level correction.
    e. Apply these corrections for each of the PRNs to develop a
       single elevation curve.
    f. Comparing these curves for two different antennas will give
       a pretty good idea of the relative performance. All the
       averaging over satellites and azimuths helps to remove the
       error sources described above.

Comparing the stuff in out paper (and what Gerry suggested doing) with your
scheme is rather like the difference between cantelope seeds and
watermelons.

The material in our paper (and as delivered by the several groups doing
outdoor range measurements using GPS as the signal source -- including what
Gerry was suggesting) has also concentrated in locating the antenna phase
center at mm-levels (especially its variation with elevation), in studying
the azimuthal symmetry of these antennas, and in trying to understand the
effects of near-field objects on these parameters. These are the properties
that become critical to those using GPS for high precision measurements.

73, Tom

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14. [tacgps] Re: GPS Antennas

From: Gerry Creager <gerry@cs.tamu.edu>
Date: Mon, 12 Feb 2001 10:21:26 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134633-2001.02.12-10.36.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks Shera wrote:
>
> Hi Tom
>
> While we are on the topic of "amateur" and "professional" measurements...
>
> I think some folks are interested in multipath reduction more than the
> angle-averaged phase center data which you focused on in your previous

> articles. I believe that multipath reduction is the main reason for using a
> choke ring design in the first place. Am I wrong? If not parameters such
> as LHP rejection and low-angle signal rejection may be of considerable
> interest. Hopefully your new article in GPS World will discuss these.

Indeed, increasing the inductance of the antenna raises the Q. Recall
that an antenna, especially inthis instance, incorporates the active
element and the associated support structures. Including the Choke
Ring.

I personally suspect that there's also an element of multipath
mitigation by knife-edge diffraction on some of these antennas... but
I've not had time to test this. If memory serves, Tom thinks I'm crazy
on this!

> It is seems important to have an evaluation of the your baking pan choke
> ring vs. a plain absorber, or a even just a flat ground plane, by someone
> such as yourself who has the equipment to do it right. So far I haven't
> found a reference that discusses the effectiveness of even the machined
> JPL-type choke rings. Is there a published paper (hopefully in a refereed
> journal) from JPL about this? Doesn't the "scientific method" suggest that
> a comparison measurement with just a bare Antenna 97 be published?

The Dorne-Margolin (JPL) choke ring design is shrouded in a bit of
legend. I'm told that a discussion of multipath mitigation was
occurring in the Los Angeles area at one of the finer drinking
establishments, and one of the participants had designed the choke ring
for one of the planetary probes JPL is known for (Viking, I
believe...). He sketched out a rough design and made it look official
by adding numbers approximating the ring heights and diameters for L1,
based on mental math and memory. Someone scooped up the napkin and took
it to the machine shop the next day and said "Build this. This way."
And thus was born the reference antenna... Tom? Is this urban legend
correct? I've heard it from 3 or 4 sources, now, but something tells me
you might have been there, too...

> For me, an Antenna 97 on your baking pan choke ring performed qualitatively
> the same as the identical antenna on a simple flat ground plane, in regard
> to multipath rejection. For this comparison I estimated the multipath by
> comparing double-differenced code phases with double-differenced carrier
> phases for the same pair of sats over a period of time. This is not a
> precise measurement but it's cheap and perhaps represents the performance
> one can expect under typical operating conditions. Unfortunately it seems
> to be the only data available (is it the antelope seed or the watermelon?).

What was your multipath environment? If you were already in a benign
environment, it may be difficult to determine any difference.

73, gerry
--
Gerry Creager | Never ascribe to Malice that
AATLT | which can adequately be
Texas A&M University | explained by Stupidity.
979.458.4020 (Phone) | -- Lazarus Long
979.847.8578 (Fax)

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15. [tacgps] Re: GPS Antennas

From: "Brooks Shera" <ebs@lanl.gov>
Date: Sun, 11 Feb 2001 20:54:27 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134539-2001.02.11-22.09.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

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Brooks

----- Original Message -----
From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, February 11, 2001 15:01 PM
Subject: [tacgps] Re: GPS Antennas

> Bob Bruninga wrote:
>
> > (For simple tests of course...)
> > Any GPS antenna in the clear, combined with the GPS constellation is a
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I
> disagree strongly with your use of "completely" and "calibrated". Here are
> some reasons:
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> 1. Your scheme assumes that the NEMA message is a correct representation
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> S/(S+N). Experience has shown that it can be incorrect at levels of a few
> dB. [If there is any real interest, I could explain why the reported
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> And most important, you need to perform the sum over the satellites that
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> 4. You also need to account for the fact that the 1/r^2 satellite range
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> around 33-34 dB. Assume that you have a pretty good LNA and this gives you
> a system temperature of ~100K. Experience shows that each GPS satellite
> adds about 20K of noise with a conventional antenna, so with 33 dB of
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> the GPS satellite contributes about 40,000K on axis. It is very unlikely
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> The object of the 40' thought experiment I propose is to measure the main
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>
> Now we note that a power drop from 0.9975 to 0.9756 represents a change in
> the NMEA parameter of less than 0.1 dB. Even if you move further to
the -20
> db point, you still have:
>
>   S/S+N = 400/(400+100) = 0.8
>
> seen the parameter reported in the NMEA message drop by only 0.97 dB, and
> that is still less that the quantization reported in the NMEA numbers!
>
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> like:
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> the azimuthal symmetry of these antennas, and in trying to understand the
> effects of near-field objects on these parameters. These are the
properties
> that become critical to those using GPS for high precision measurements.
>
> 73, Tom
>
> ---

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>

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16. [tacgps] re: recent info

From: Scott Tillman <dpseng@primenet.com>
Date: Mon, 12 Feb 2001 12:41:04 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134661-2001.02.12-13.57.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

After a while of slow activity, this is great and educational
information. I appreciate those who have the necessary math and
skill to advance usage of GPS to those of us lower in the food
chain.

scott k7ysv

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17. [tacgps] Re: GPS Antennas

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Mon, 12 Feb 2001 23:16:30 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134735-2001.02.12-22.31.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry
> I personally suspect that there's also an element of multipath
> mitigation by knife-edge diffraction on some of these antennas... but
> I've not had time to test this. If memory serves, Tom thinks I'm crazy
> on this!

Gerry -- you misquoted me. The problem is that most of the multipath
effects are in the near field of the antenna. Knife-Edge Diffraction
requires you to see the EM field over a few wavelengths. The correct term
in the near field is "scattering".

In point of fact, something related to this has been one of my personal
antenna vendettas. It has been found that when the JPL-style choke rings
are mounted on a large concrete pier, a multipath error develops that is
not seen when they are on a smaller pier. By large: typical IGS monuments
(including my GODE site) are 24"-30" (GODE is 30") diameter concrete
structures. When the same antenna is mounted nearby on a tripod (or on a
concrete pier smaller than the ~14" outer diameter of the aluminum rings)
the behavior is much different. This effect is mitigated when the large
concrete pier is covered in microwave absorber. So what is happening.

In the GPSW paper, you will see some of the tests refer to "foilboard" (the
1/2" thick urethane foam insulation covered with aluminum foil) and "cement
board" (like sheetrock, but with concrete instead of gypsum).

Several years ago I found that when a conductive sheet the diameter of the
concrete pier was behind the antenna (at the same place as the concrete
would have been, as mimicked in Fig.6), we saw a multipath-like signal at
>>> HIGH <<< elevation angles. The red curve in Fig.7 in GPSW, pg.51 shows this. It turns out that the
red curve is precisely the shape of the J1(x) Bessel function that describes the beam pattern of a
uniformly illuminated circular aperture the size of the pier. In optics this is known as the Airy disk
where the beam pattern for a telescope is described as 1.22 lambda/D. My speculation was that the
dielectric properties of the concrete pier behind the antenna was causing a classical "Airy disk"
diffraction, which would show up at HIGH elevation angles. Which of course is counter to conventional
wisdom where multipath is a LOW elevation effect.

This is what gives rise to our statement (bullet 2 in the 3rd column of
Pg.54) that anything near the antenna can & will affect the patterns.

To answer one of Brooks' points -- yes, I have done a "nude" Antenna 97.
However there really is no such thing as a "nude" small patch antenna.
Normally they are designed to be mag- mounted on a car's roof, in which
case they are effectively over an effectively infinite ground plane. If not
mounted on a plane and dangled in the breeze, everything else nearby
(including the antenna's coax, or in our case, the mounting jig and the

antenna positioner seen in Fig.1 & 2) are impossible to remove. So I tend
to discount any measurements on any of the small patch antennas.

You also said
> The Dorne-Margolin (JPL) choke ring design is shrouded in a bit of
> legend. I'm told that a discussion of multipath mitigation was
> occurring in the Los Angeles area at one of the finer drinking
> establishments, and one of the participants had designed the choke ring
> for one of the planetary probes JPL is known for (Viking, I
> believe...). He sketched out a rough design and made it look official
> by adding numbers approximating the ring heights and diameters for L1,
> based on mental math and memory. Someone scooped up the napkin and took
> it to the machine shop the next day and said "Build this. This way."
> And thus was born the reference antenna... Tom? Is this urban legend
> correct? I've heard it from 3 or 4 sources, now, but something tells me
> you might have been there, too...

You have mixed up several of the stories I've told you. Perhaps your vision
was clouded by fermented Moravian Barley ;<}. Yes, I was there for some of
the incidents and know the players well.

The principal individual was Donovan Spitzmesser (who used to be W6??? but
let his license lapse), now retired from JPL. Some of the events occurred
in the middle of the Mojave desert at Barstow. The drinking establishment
incident concerned the use of a 2-turn tapered helix antenna. The taper on
one particular SOLO disposable plastic drinking is just right to make a
helix that covers both the L1 & L2 frequencies. Don also pointed out that
putting said helix in an 8" diameter salad bowl was a good thing, thus
giving rise to the infamous "helibowl" antenna. I later did detailed range
measurements and developed an analytic theory relating the size of the
salad bowl to the size of the beam. This allowed the helibowl to be used as
a dish feed on dishes with several different f/D rations.

The need for choke ring structures was a separate activity. Don did the
initial design/prototype for a compromise choke ring structure to cover
both L1 & L2. He decided that the rings should be about 2-1/2" deep, 1"
wide and 1/8" thick. To this day, the standard choke ring sold by Ashtech,
Trimble, Leica, Osborne, etc. has 2.50000" ring depth, 1.00000" ring gap
and 0.125000" ring thickness. Only the new Javad antenna is different. It
is metallized injection molded plastic with integral metric dimensions (I
believe our ION+GPSW papers are the first time that the standard choke ring
has been compared to the new Javad design).

Another "urban legend" concerns the 7.61 cm high "spike" used to center
these antennas at geodetic markers. Another JPL engineer, Steve Dinardo was
the source for this standard. Steve was a pretty big guy and has a hard
time affixing the Type-N connector on the base of these antennas. 7.61 cm
was chosen because it was the first spike Steve found that would let him
get his fist into the gap between the bottom of the antenna and the
monument.

All the Voyager and Viking antenna stories have to do with dual S/X dish
feeds and small dishes and nothing to do with GPS. And yes, I had something
to do with applying these designs.

73, Tom

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18. [tacgps] Re: GPS Antennas

From: "Ira A. Wilner" <bdcst@sover.net>
Date: Mon, 12 Feb 2001 20:05:09 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134717-2001.02.12-20.04.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

-----Original Message-----
From: Gerry Creager <gerry@cs.tamu.edu>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Date: Monday, February 12, 2001 11:23 AM
Subject: [tacgps] Re: GPS Antennas

>
>I personally suspect that there's also an element of multipath

>mitigation by knife-edge diffraction on some of these antennas... but
>I've not had time to test this. If memory serves, Tom thinks I'm crazy
>on this!
>

Hi Gerry & Tom,

Is the wavelength small enough to place the edges of the choke rings out of
the near field of the active antenna element? And how about signal
polarization angle versus elevation angle and the "knife edge" effect of
the rings?

Inquiring minds and all that jazz...
--Ira

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19. [tacgps] Re: GPS Antennas

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Tue, 13 Feb 2001 07:40:20 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134790-2001.02.13-07.55.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Ira A. Wilner" wrote:
>
> -----Original Message-----
> From: Gerry Creager <gerry@cs.tamu.edu>
> To: TAPR Special Interest Group <tacgps@lists.tapr.org>
> Date: Monday, February 12, 2001 11:23 AM
> Subject: [tacgps] Re: GPS Antennas
>
> >
> >I personally suspect that there's also an element of multipath
> >mitigation by knife-edge diffraction on some of these antennas... but
> >I've not had time to test this. If memory serves, Tom thinks I'm crazy
> >on this!
> >
>
> Hi Gerry & Tom,
>
> Is the wavelength small enough to place the edges of the choke rings out of
> the near field of the active antenna element? And how about signal
> polarization angle versus elevation angle and the "knife edge" effect of
> the rings?

Good questions, and Tom's answer is also a good one. The scattering
effect of near-field ring elements is more in line with reality than
knife-edge diffraction. Were we looking at rings 4-6 lambda away, I
might really start to argue that we were far enough out to see a
knife-edge effect... but in this case, I let my fingers get ahead of
either a thought process, or reality.

Now: polarization: Because of the unpredictable angle(s) of incidence
of the reflectors contributing to multipath, I think we can safely
assume a distribution that will include both appropriate polarization
and an adequately flat angle to allow for a diffractive scattering in
both near- and far-fields to occur. I've not modelled this: It's been
a topic of discussion over a number of malted beverages, but I kept
thinking I was gonna get the outdoor range up and do some empirical
tests. I guess it's time to crank up the parallel processors again,
instead!

And, I feel like I must note that the Inquirer is not generally the peer
review publication of choice for most of my work...;-)

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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20. [tacgps] Test

From: "Charles E. Heisler" <cheisler@blazenet.net>
Date: Mon, 12 Feb 2001 20:23:57 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134715-2001.02.12-19.39.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Sorry Gang....Just Delete

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21. [tacgps] Motorola gps receiver

From: HBonhorst@aol.com
Date: Tue, 13 Feb 2001 16:32:26 EST
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134871-2001.02.13-15.47.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

part number is A11121P118
its approx. 5 Years old.
Can somebody tell me more about this unit?
Where can I find the command reference?
Please help
Thank you in advance
Hubert, DB7ME

22. [tacgps] RE: Motorola gps receiver

From: "Richard M. Hambly" <rick@cnssys.com>
Date: Tue, 13 Feb 2001 17:27:45 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <HBonhorst@aol.com>
Message-ID: <LYR6754-134884-2001.02.13-16.42.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hubert,

This is a Motorola "Basic Oncore" with DGPS, RTC and 1PPS outputs.It does not have carrier phase or battery backup options. Almost all of these were 6-channel units but those made after Nov 1996 were 8-channel. The firmware is probably very old, V5.4 and 6.0 were common then. Current firmware is V10.0. The latest firmware that can be applied to those old boards is 8.8, I believe.

Unfortunately, the command reference for the Basic Oncore is not in print but the newer version for the Oncore VP is available from Synergy Systems, LLC in San Diego for about $50 or so. See them at http://www.synergy-gps.com/. There is a similar command reference for the UT and GT Oncores available free at http://www.synergy-gps.com/TR_Manual.html. Be careful, however, there are some important differences between the VP and the UT/GT. But free is a lot cheaper that $50!

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org]On Behalf Of HBonhorst@aol.com
Sent: Tuesday, February 13, 2001 4:32 PM
To: TAPR Special Interest Group
Subject: [tacgps] Motorola gps receiver

part number is A11121P118
its approx. 5 Years old.
Can somebody tell me more about this unit?
Where can I find the command reference?
Please help
Thank you in advance
Hubert, DB7ME

23. [tacgps] RE: Motorola gps receiver

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 13 Feb 2001 16:05:39 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134880-2001.02.13-16.21.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I looked on Synergy's site, the Motorola distributor for GPS in the USA, its
not listed.

I am wondering if its the old PVT-6, a 6 channel timing/carrier phase GPS
unit.....Brooks might know....

> ----------
> From: HBonhorst@aol.com[SMTP:HBonhorst@aol.com]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, February 13, 2001 3:32 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Motorola gps receiver
>
> part number is A11121P118
> its approx. 5 Years old.
> Can somebody tell me more about this unit?
> Where can I find the command reference?
> Please help
> Thank you in advance
> Hubert, DB7ME
>

24. [tacgps] RE: Motorola gps receiver

From: Gerry Creager <gerry@cs.tamu.edu>
Date: Wed, 14 Feb 2001 02:06:31 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134949-2001.02.14-02.21.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'll have to check but that looks familiar: like a6-channel OnCore. I
may have the secret decoder ring in the docs at home to figure it out.
If I'm not completely brain-dead in the morning (network problems
tonite) I'll snag that notebook and bring it in.

73, gerry
--
Gerry Creager | Never ascribe to Malice that
AATLT | which can adequately be
Texas A&M University | explained by Stupidity.
979.458.4020 (Phone) | -- Lazarus Long
979.847.8578 (Fax)

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25. [tacgps] RE: Motorola gps receiver

From: "Brooks Shera" <ebs@lanl.gov>
Date: Tue, 13 Feb 2001 20:40:59 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-134914-2001.02.13-21.55.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

RE: [tacgps] Motorola gps receiverHi Brian et al.

I have a couple of the "old" PVT-6 units that are at least 5 years old and their parts numbers both
start with PVT06 xxxxxx, so I would guess Bonhorst's unit is not a PVT-6. Perhaps the best way to find
out more is to e-mail Randy Warner at Info@synergy-gps.com.

Brooks

  ----- Original Message -----
  From: Kirby, Brian
  To: TAPR Special Interest Group
  Sent: Tuesday, February 13, 2001 15:05 PM
  Subject: [tacgps] RE: Motorola gps receiver

  I looked on Synergy's site, the Motorola distributor for GPS in the USA, its not listed.

  I am wondering if its the old PVT-6, a 6 channel timing/carrier phase GPS unit.....Brooks might
know....

From: HBonhorst@aol.com[SMTP:HBonhorst@aol.com]
Reply To: TAPR Special Interest Group
Sent: Tuesday, February 13, 2001 3:32 PM
To: TAPR Special Interest Group
Subject: [tacgps] Motorola gps receiver

part number is A11121P118
its approx. 5 Years old.
Can somebody tell me more about this unit?
Where can I find the command reference?
Please help
Thank you in advance
Hubert, DB7ME

26. [tacgps] RE: Motorola gps receiver

From: jim_johnson@agilent.com
Date: Wed, 14 Feb 2001 09:20:23 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135026-2001.02.14-11.54.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a unit here that we have been calling a PVT-6 all
this time. I have it powering up as I type. TAC32 identifies
it as a Motorola VP, but I'm not sure TAC32 has the ability
to flag a PVT-6 anymore (Rick?). I think the older versions
used to ID a PVT-6. The version I'm using is 2.5 (TAC32).
I have another unit we also call a PVT-6 and I'll power it up
shortly. It has a completely different PC board layout so
I'm not sure what it will show. TAC32 gives the following
data about the one powering up now ...

COPYRIGHT 1991-1994 MOTOROLA, INC.
SOFTWARE VER #5
SOFTWARE REV #0
SOFTWARE DATE 20 JAN 1994
MODEL# A11121A115
SERIAL# SSG0038200
MANUFACTUR DATE 350AMA129

@@Ba: OK - must be a 6-channel Rcvr

(other data omitted).

So, I ask, is this a PVT-6? I think it is.

73,
Jim W6SC

Jim Johnson
Agilent Technologies
jim_johnson@agilent.com
"Innovating the HP Way"

-----Original Message-----
From: Brooks Shera [mailto:ebs@lanl.gov]
Sent: Tuesday, February 13, 2001 7:41 PM
To: TAPR Special Interest Group
Subject: [tacgps] RE: Motorola gps receiver

Hi Brian et al.

I have a couple of the "old" PVT-6 units that are at least 5 years old and
their parts numbers both start with PVT06 xxxxxx, so I would guess
Bonhorst's unit is not a PVT-6. Perhaps the best way to find out more is to
e-mail Randy Warner at Info@synergy-gps.com <mailto:Info@synergy-gps.com> .

Brooks

----- Original Message -----
From: Kirby, Brian <mailto:Brian.Kirby@MSFC.NASA.GOV>
To: TAPR Special <mailto:tacgps@lists.tapr.org> Interest Group
Sent: Tuesday, February 13, 2001 15:05 PM
Subject: [tacgps] RE: Motorola gps receiver

I looked on Synergy's site, the Motorola distributor for GPS in the USA, its
not listed.

I am wondering if its the old PVT-6, a 6 channel timing/carrier phase GPS
unit.....Brooks might know....

From: HBonhorst@aol.com[SMTP:HBonhorst@aol.com
<mailto:HBonhorst@aol.com[SMTP:HBonhorst@aol.com>]
Reply To: TAPR Special Interest Group
Sent: Tuesday, February 13, 2001 3:32 PM
To: TAPR Special Interest Group
Subject: [tacgps] Motorola gps receiver

        part number is A11121P118
its approx. 5 Years old.
Can somebody tell me more about this unit?
Where can I find the command reference?
Please help
Thank you in advance
Hubert, DB7ME

27. [tacgps] Re: GPS choke ring

From: Dr Thomas A Clark <clark@aleph.gsfc.nasa.gov>
Date: Wed, 14 Feb 2001 18:32:06 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR TACGPS SIG <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135043-2001.02.14-12.46.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Charles E. Heisler" wrote:
>
>   Hi Tom; I am preparing to build yet another one of the Antennas
> you have described from time to time, but I have a question regarding
> the pie plate/duct cap GPS choke ring antenna.   What is the purpose
> of the threaded post soldered in the center of the outlet box. Is it merely
> to secure it to a base with a bolt or stud from the bottom?
>
>   Thanks -73-
>   Charlie
>   K3VDB
>

I use my antennas on top of a standard surveying tripod. The threaded
stud is 5/8-11 which matches the standrard surveying instruments. In the
top is a small 5/8-11" hex setscrew with a 1/4" hex. I have a 4-40 or
6-32 hex nut in the hole to mate with a flat-head machine screw thru
the center of the plate. This serves to reference the center of the GPS
patch antenna to the center of the 5/8-11 thread to better than 1 mm.

Tom

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28. [tacgps] Motorola gps receiver

From: HBonhorst@aol.com
Date: Wed, 14 Feb 2001 17:50:59 EST
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135091-2001.02.14-17.05.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

First of all I want to say thank you for the effort
Might be the receiver ID message could be helpful
SFTW P/N # 98-P39949M
Version 8 Rev. 4 Date 13 JUL 1995
MODEL # A11121 P 118
HDWR P/N #_
SERIAL SSG0173454
MANUFACTUR DATE 6H19
OPTION LIST IB

TAC32 evaluation version reports
Motorola VP, Bin, 6ch, V8.4, has DGPS, T-RAIM

Hubert DB7ME

29. [tacgps] Re: Motorola gps receiver

From: info@synergy-gps.com
Date: Wed, 14 Feb 2001 15:26:57 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135093-2001.02.14-17.41.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hubert,

The ID data you've provided indicates a 6 channel Basic Oncore.
The version 8.4 firmware, released during the Summer of 1995, was
also used in the 8 channel Basic Oncore which (unfortunately)
shared the same part number. During the transition from 6 to 8
channle Basic Oncore models, some of the newer 8 channel units
could be operated in 6 channel mode (but not the other way
around).

Option I indicates 1PPS with Timing Receiver Autonomous Integrity
Monitor (TRAIM) and Option B indicates differential input capability
(DGPS). The on-board RTC was standard (previously optional).

The Basic Oncore shipped in a protective, black plastic housing
identical to the previous PVT-6 OEM GPS receiver. The PVT-6
was renamed to Basic Oncore in 1995 so that this product
(Motorola's first OEM board shipped in volume) would fit into the
same marketing category with the (then) new VP Oncore. If you
wish, we can fax (no PDF available) the multi-page Basic Oncore
Engineering Notes to you on receipt of your fax number and
address (which our electronic fax need to function). Hope this helps.

Thanks & Regards,

Art Sepin

---------- Reply Separator ----------

> First of all I want to say thank you for the effort
> Might be the receiver ID message could be helpful
> SFTW P/N # 98-P39949M
> Version 8 Rev. 4 Date 13 JUL 1995
> MODEL # A11121 P 118
> HDWR P/N #_
> SERIAL SSG0173454
> MANUFACTUR DATE 6H19
> OPTION LIST IB
>
> TAC32 evaluation version reports
> Motorola VP, Bin, 6ch, V8.4, has DGPS, T-RAIM
>
> Hubert DB7ME
>

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Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
 lat N 32.54' 43.9612 Lon W 117 06' 41.8060
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30. [tacgps] RE: Motorola gps receiver

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Wed, 14 Feb 2001 21:56:10 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135120-2001.02.14-21.10.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim, W6SC asked about

> COPYRIGHT 1991-1994 MOTOROLA, INC.
> SOFTWARE VER #5
> SOFTWARE REV #0
> SOFTWARE DATE 20 JAN 1994
> MODEL# A11121A115
> SERIAL# SSG0038200

> MANUFACTUR DATE 350AMA129
>
> @@Ba: OK - must be a 6-channel Rcvr

5.0 is an original PVT6. Version 5 was the first firmware Motorola released
after Mirhan Miranian(USNO) and I worked with Mike King (Moto) to make a
real timing receiver from their old "6-Pack". This one is a real antique
that should be gold plated and hung from the rear view mirror along with
the fuzzy dice and baby shoes!

73, Tom

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31. [tacgps] Re: GPS Antennas

From: Boyd Prestwood K5YKG <k5ykg@bellatlantic.net>
Date: Wed, 14 Feb 2001 22:29:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135122-2001.02.14-21.43.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr Thomas A Clark (W3IWI)" wrote:
>
> Those of you who have an interest in precision GPS antennas might find a
> paper by Schupler & Clark in the Feb.2001 GPS World, pages 48-55 of
> interest. [In fact, you MUST find it of interest, since I'm one of the
> authors.]

How does one go about getting a subscription to GPS World? Is is a free
trade magazine or can a paid subscription be obtained? Thanks for info.

73 de Boyd Prestwood, K5YKG
k5ykg@bellatlantic.net

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32. [tacgps] RE: Motorola gps receiver

From: info@synergy-gps.com
Date: Wed, 14 Feb 2001 16:24:40 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135105-2001.02.14-18.39.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim,

The 6 channel PVT-6 matches the part number you describe. The
Motorola PVT-6 was originally shipped in a black plastic housing
as were the later 6 and 8 channel Basic Oncore units.

Your unit, at 3.94 in. x 2.76 in. x 0.7 in. is slightly larger than the
later VP Oncore (at 3.25 in. x 2.00 in. x 0.64 in). All PVT-6 and
Basic Oncore products included an on-board, automotive compliant
regulator for operation from 9 VDC to 16 VDC (12VDC nominal).
This unit could also operate from a regulated 5 VDC source
(separate pin).

Version 5.0 firmware included fixes, suggested by the then young,
handsome, ever vigilant, yet to break a leg at ION, Dr. Tom Clark,
which corrected some 1PPS to UTC offsets (in previous firmware
versions). The "A" in the middle of the part number indicates 1PPS
option. Timing Receiver Autonomous Integrity Monitor (TRAIM) was
introduced later in version 8.4 of the firmware.

I believe the product you have can be updated to version 8.4
firmware which includes TRAIM and other features. Randy Warner
here (randy@synergy-gps.com) could confirm this but he's out
today. If a firmware upgrade is possible, we'll perform the work at
no charge for the 1st couple of units and $20 for additional units
(this is an offer available to Hams only!). If Randy confirms that an
upgrade is possible, we'll add Carrier Phase (GPS Raw Data) at no
additional charge.

We can fax (no PDF available) the Basic Oncore Engineering
Notes (essentially the same as the PVT-6) on receipt of your fax
number and address (which our electronic fax needs to function).

Hope this helps.

Thanks & Regards,

Art Sepin
K6IWS (CW freak, Ret)

----------------- Reply Separator --------------------

> I have a unit here that we have been calling a PVT-6 all
> this time. I have it powering up as I type. TAC32 identifies
> it as a Motorola VP, but I'm not sure TAC32 has the ability
> to flag a PVT-6 anymore (Rick?). I think the older versions
> used to ID a PVT-6. The version I'm using is 2.5 (TAC32).
> I have another unit we also call a PVT-6 and I'll power it up
> shortly. It has a completely different PC board layout so
> I'm not sure what it will show. TAC32 gives the following
> data about the one powering up now ...
>
> COPYRIGHT 1991-1994 MOTOROLA, INC.
> SOFTWARE VER #5
> SOFTWARE REV #0
> SOFTWARE DATE 20 JAN 1994
> MODEL# A11121A115
> SERIAL# SSG0038200
> MANUFACTUR DATE 350AMA129
>
> @@Ba: OK - must be a 6-channel Rcvr
>
> (other data omitted).
>
> So, I ask, is this a PVT-6? I think it is.
>
> 73,
> Jim W6SC
>
>
>
>   ---
>   Jim Johnson
>   Agilent Technologies
>   jim_johnson@agilent.com
>   "Innovating the HP Way"
>
> -----Original Message-----
> From: Brooks Shera [mailto:ebs@lanl.gov]
> Sent: Tuesday, February 13, 2001 7:41 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola gps receiver
>
>
> Hi Brian et al.
>
> I have a couple of the "old" PVT-6 units that are at least 5 years old
> and their parts numbers both start with PVT06 xxxxxx, so I would guess
> Bonhorst's unit is not a PVT-6. Perhaps the best way to find out more
> is to e-mail Randy Warner at Info@synergy-gps.com
> <mailto:Info@synergy-gps.com> .
>
> Brooks
>
>
> ----- Original Message -----
> From: Kirby, Brian <mailto:Brian.Kirby@MSFC.NASA.GOV>
> To: TAPR Special <mailto:tacgps@lists.tapr.org> Interest Group
> Sent: Tuesday, February 13, 2001 15:05 PM
> Subject: [tacgps] RE: Motorola gps receiver
>
>
> I looked on Synergy's site, the Motorola distributor for GPS in the
> USA, its not listed.
>
> I am wondering if its the old PVT-6, a 6 channel timing/carrier phase
> GPS unit.....Brooks might know....
>
> ----------
> From: HBonhorst@aol.com[SMTP:HBonhorst@aol.com
> <mailto:HBonhorst@aol.com[SMTP:HBonhorst@aol.com>]
> Reply To: TAPR Special Interest Group

> Sent: Tuesday, February 13, 2001 3:32 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Motorola gps receiver
>
> part number is A11121P118
> its approx. 5 Years old.
> Can somebody tell me more about this unit?
> Where can I find the command reference?
> Please help
> Thank you in advance
> Hubert, DB7ME
>
>

Synergy Systems, LLC P.O. Box 262250, San Diego, CA 92196
Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
 lat N 32.54' 43.9612 Lon W 117 06' 41.8060
Motorola's leading ONCORE GPS Distributor in the Americas

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33. [tacgps] RE: Motorola gps receiver

From: jim_johnson@agilent.com
Date: Thu, 15 Feb 2001 14:19:43 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135341-2001.02.15-16.34.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,

  Thanks for the positive ID on the unit. I'll
put it next to my hoola hoop and penny loafers!

73,
Jim W6SC

> -----Original Message-----
> From: Tom Clark (W3IWI) [mailto:clark@aleph.gsfc.nasa.gov]
> Sent: Wednesday, February 14, 2001 6:56 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Motorola gps receiver
>
>
> Jim, W6SC asked about
>
> > COPYRIGHT 1991-1994 MOTOROLA, INC.
> > SOFTWARE VER #5
> > SOFTWARE REV #0
> > SOFTWARE DATE 20 JAN 1994
> > MODEL# A11121A115
> > SERIAL# SSG0038200
> > MANUFACTUR DATE 350AMA129
> >
> > @@Ba: OK - must be a 6-channel Rcvr
>
> 5.0 is an original PVT6. Version 5 was the first firmware
> Motorola released
> after Mirhan Miranian(USNO) and I worked with Mike King
> (Moto) to make a
> real timing receiver from their old "6-Pack". This one is a
> real antique
> that should be gold plated and hung from the rear view mirror
> along with
> the fuzzy dice and baby shoes!
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: jim_johnson@agilent.com
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>

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34. [tacgps] OCXO in GPS Frequency Standard

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Sun, 18 Feb 2001 14:05:07 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135883-2001.02.18-16.17.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am building the GPS frequency standard designed by Brooks Shera and
published in the July 1998 issue of QST. I have an HP 10811-60111 OCXO
to use in the project.

The manual I have, which actually pertains to the 10811A oscillator,
states that the supply voltage to pin 3 should be 11.0 to 13.5 VDC. The
suggested circuit, built around a 723 regulator chip, provides 12.0
VDC. However, my OCXO was delivered with the interface card
05328-20027, intended for the HP5328 universal counter. This card has a
723 chip on it, but the resistors which program the voltage are such
that the expected (and actual) voltage is 10.8 VDC. It is possible that
the OCXO interface card was originally designed and intended to support
an HP10544A oscillator instead of the 10811A unit.

Is there an actual difference in the operating voltages recommended for
these two OCXOs? Moreover, should I run the 10811-60111 OCXO on 10.8 or
12.0 VDC? Thanks!

73, Eric Lemmon WB6FLY

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

35. [tacgps] RE: OCXO in GPS Frequency Standard

From: "Roger Rehr W3SZ" <rrehr@epix.net>
Date: Sun, 18 Feb 2001 18:42:55 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135896-2001.02.18-17.58.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi, Eric!

I am new at this and just finishing building my GPS controller, and also
have a 10811A (with the 5328). I think the two units are identical for all
practical purposes, but this is just what I have been told.

Brooks Shera has a webpage that may help you some, though it doesn't address
the above.

Let me know if I can be of help, though it sounds like we're at about the
same place ;)

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.w3sz.bizland.com/w3sz.htm

-----Original Message-----
From: bounce-tacgps-14699@lists.tapr.org
[mailto:bounce-tacgps-14699@lists.tapr.org]On Behalf Of Eric G. Lemmon
Sent: Sunday, February 18, 2001 5:05 PM
To: TAPR Special Interest Group
Subject: [tacgps] OCXO in GPS Frequency Standard

I am building the GPS frequency standard designed by Brooks Shera and
published in the July 1998 issue of QST. I have an HP 10811-60111 OCXO
to use in the project.

The manual I have, which actually pertains to the 10811A oscillator,
states that the supply voltage to pin 3 should be 11.0 to 13.5 VDC. The

suggested circuit, built around a 723 regulator chip, provides 12.0
VDC. However, my OCXO was delivered with the interface card
05328-20027, intended for the HP5328 universal counter. This card has a
723 chip on it, but the resistors which program the voltage are such
that the expected (and actual) voltage is 10.8 VDC. It is possible that
the OCXO interface card was originally designed and intended to support
an HP10544A oscillator instead of the 10811A unit.

Is there an actual difference in the operating voltages recommended for
these two OCXOs? Moreover, should I run the 10811-60111 OCXO on 10.8 or
12.0 VDC? Thanks!

73, Eric Lemmon WB6FLY

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36. [tacgps] HP 10544A vs. 10811A

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Sun, 18 Feb 2001 19:11:49 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-135922-2001.02.18-21.26.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The 10811A will replace a 10544A, but not the other way around.

The 10544A requires a separate connection of 11.0-13.5 volts @ 10 mA typ.,
15 mA max. on pins 8 (+) and 9 (gnd) for the oven control circuit.

The 10811A draws a little more current for the oscillator/amplifier at
11.0-13.5 volts @ 30 mA typ., 40 mA max., vs. 18 mA typ., 25 mA max. for
the 10544A, also specified at 11.0-13.5 volts.

The 10811A oven circuit draws less power after warm-up, 2 W vs. 3 W for
the 10544A, both at 20-30 volts.

The 10811A/B manual mentions two other variants of the 10811A/B, the
10811-60101 and the 10811-60105, with slightly different spec's.

I have the original data sheet (JUL 76) for the 10544A, and original
data sheet (APR 80) and Operating and Service Manual (AUG 80) for the
10811A/B, if anyone needs additional information.

-- Flemming Larsen,   KB6ADS

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] Re: HP 10544A vs. 10811A

From: "Roger Rehr W3SZ" <rrehr@epix.net>
Date: Mon, 19 Feb 2001 20:49:49 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136132-2001.02.19-20.05.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Eric,

I think you are wrong about the interface card. I have the same card in the
5328 / 10811 combination I bought surplus, and everything works.

So the card is meant to and does work with the 10811.

73,

Roger W3SZ

-----Original Message-----
From: bounce-tacgps-14699@lists.tapr.org
[mailto:bounce-tacgps-14699@lists.tapr.org]On Behalf Of Eric G. Lemmon
Sent: Monday, February 19, 2001 8:32 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: HP 10544A vs. 10811A

I have the same manual, same edition, for the 10811A/B oscillator, and it
looks pretty much like the 10811-60111 OCXO that I intend to use. I have
verified that my OCXO has no connections at pins 7, 8, 9, 10, 12, and 13-
and
this agrees with the pinout diagram in Figure 3.

I'd sure like to know what differences there are, if any, between my
10811-60111 oscillator and the 10811A described in the manual. I am pretty
certain that the 05328-20027 interface card that came with my OCXO was
designed for the 10544 rather than the 10811, since there are separate
connections to pin 8 of the OCXO for oven control, and that pin is NC in the
10811.

73, Eric Lemmon WB6FLY

Flemming Larsen wrote:

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>
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> The 10811A draws a little more current for the oscillator/amplifier at
> 11.0-13.5 volts @ 30 mA typ., 40 mA max., vs. 18 mA typ., 25 mA max. for
> the 10544A, also specified at 11.0-13.5 volts.
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>
> The 10811A/B manual mentions two other variants of the 10811A/B, the
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>
> I have the original data sheet (JUL 76) for the 10544A, and original
> data sheet (APR 80) and Operating and Service Manual (AUG 80) for the
> 10811A/B, if anyone needs additional information.
>
> -- Flemming Larsen,   KB6ADS
>
> ---
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38. [tacgps] Re: HP 10544A vs. 10811A

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Mon, 19 Feb 2001 17:32:08 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136128-2001.02.19-19.44.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have the same manual, same edition, for the 10811A/B oscillator, and it
looks pretty much like the 10811-60111 OCXO that I intend to use. I have
verified that my OCXO has no connections at pins 7, 8, 9, 10, 12, and 13- and
this agrees with the pinout diagram in Figure 3.

I'd sure like to know what differences there are, if any, between my
10811-60111 oscillator and the 10811A described in the manual. I am pretty
certain that the 05328-20027 interface card that came with my OCXO was
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10811.

73, Eric Lemmon WB6FLY

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> The 10544A requires a separate connection of 11.0-13.5 volts @ 10 mA typ.,
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> The 10811A oven circuit draws less power after warm-up, 2 W vs. 3 W for
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> 10811-60101 and the 10811-60105, with slightly different spec's.
>
> I have the original data sheet (JUL 76) for the 10544A, and original
> data sheet (APR 80) and Operating and Service Manual (AUG 80) for the
> 10811A/B, if anyone needs additional information.
>
> -- Flemming Larsen,   KB6ADS
>
> ---
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39. [tacgps] Re: HP 10544A vs. 10811A

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Mon, 19 Feb 2001 22:22:03 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136194-2001.02.20-00.41.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> I'd sure like to know what differences there are, if any, between my
> 10811-60111 oscillator and the 10811A described in the manual.

The 10811A is the high-end unit with lots of tight specs.
There are several variations of the 10811, denoted with
-60xxx suffixes, most of which have relaxed specs.

For example,

- The 10811A has performance specs for magnetic and
  gravitational fields; the 10811-60111 drops these specs.

- The 10811A has time domain specs from 1 ms to 100 s
  (e.g., 5E-12 at 1 s); the 10811-60111 has only a
  specification at 1 s (1E-11).

- The temperature spec for the 10811A is given as <4.5E-9
  (-55C to +71C) and <2.5E-9 (0C to 71C). The 10811-60111
  is specified at only <7E-9 and only from 0 to 71C.

All other specs, including aging, EFC range, and phase
noise are the same between the two models.

There are about a dozen other -60xxx variations all together.
The -60111 seems the most common (often found in old HP
frequency counters with option 01).

I assume the logic behind this is that not all oscillators
perform the same when manufactured and not all HP
instruments need the same quality of oscillator. It
reduces testing time and increases yield to have P/N
variants such at the 10811-60111.

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

40. [tacgps] Re: HP 10544A vs. 10811A

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Mon, 19 Feb 2001 23:33:36 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136199-2001.02.20-01.48.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Tom,

This confirms what I already knew, but which I have never seen in print.

My 10811A was possibly one of my best purchases on eBay.

It came in a very handsome carrying-case, labelled:

   HP 435B-K26 FREQUENCY-POWER REFERENCE

This is probably an item worth looking for at your local surplus store or
local ham radio flea market.

-- Flemming Larsen,   KB6ADS ex. OZ6OI

> -----Original Message-----
> From: bounce-tacgps-17114@lists.tapr.org
> [mailto:bounce-tacgps-17114@lists.tapr.org]On Behalf Of Tom Van Baak
> Sent: Monday, February 19, 2001 22:22
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: HP 10544A vs. 10811A
>
>

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41. [tacgps] Re: GPS Antennas

From: Dr Thomas A Clark <clark@aleph.gsfc.nasa.gov>
Date: Tue, 20 Feb 2001 16:11:48 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136270-2001.02.20-10.26.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Boyd Prestwood asked:

> How does one go about getting a subscription to GPS World? Is is a free
> trade magazine or can a paid subscription be obtained? Thanks for info.

GPS World is a trade magazine that is free to "qualified subscribers"
and (according to a recent bingo card) costs $64/year if you pay (I
don't know anybody, outside of libraries who actually pays). You can go
to their web page at

    http://www.gpsworld.com.

If you want to try for a free subscription, fill out the form at URL

    https://www.advanstar.com/subscribe/gps/

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

42. [tacgps] Motorola UT+ price reduction

From: "Brooks Shera" <ebs@lanl.gov>
Date: Wed, 21 Feb 2001 09:04:03 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136589-2001.02.21-10.18.57--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Art Sepin at Synergy (info@synergy-gps.com) informs me that price of the
Motorola UT+ with battery has been reduced to $121.50 (this includes the
ham/educational discount). It was formerly about $160. A good deal gets
even better!

The Motorola antennas have also been reduced in price.

Brooks

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

43. [tacgps] Re: HP 10544A vs. 10811A

From: "Roger Rehr W3SZ" <rrehr@epix.net>
Date: Thu, 22 Feb 2001 01:20:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136780-2001.02.22-00.36.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HI Eric,

I hooked up my 10811-60111 on the 05328-20027 interface card, in the 5328,
as I indicated I would in email several days ago. Specifically, I removed
the blue trimpot from the interface card, and ran the three connections from
where the trimpot used to be over to the GPS controller through "Ra and Rb".
I don't have the controller working yet, but with this arrangement I am able
to control the frequency of the 10811 and the counter by varying Ra and Rb,
just as it should be. So that is the way to do the interface:

previous wiper connection of trimpot to wiper of Ra (this is pin 6 of the
oscillator connector)

previous top connection of trimpot to top of Ra (this is pin 8, or the 12V
control voltage)

previous bottom connection of trimpot (ground)

Now if I can just get the controller itself ready to roll ;)

That should be all you have to do, as we have the same oscillator and the
same interface card; mine is in the 5328, so when Im done the counter should
be REALLLY accurate ;)

Hope that helps...

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.w3sz.bizland.com/w3sz.htm

-----Original Message-----
From: bounce-tacgps-14699@lists.tapr.org
[mailto:bounce-tacgps-14699@lists.tapr.org]On Behalf Of Eric G. Lemmon
Sent: Monday, February 19, 2001 8:32 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: HP 10544A vs. 10811A

I have the same manual, same edition, for the 10811A/B oscillator, and it
looks pretty much like the 10811-60111 OCXO that I intend to use. I have
verified that my OCXO has no connections at pins 7, 8, 9, 10, 12, and 13-
and
this agrees with the pinout diagram in Figure 3.

I'd sure like to know what differences there are, if any, between my
10811-60111 oscillator and the 10811A described in the manual. I am pretty
certain that the 05328-20027 interface card that came with my OCXO was
designed for the 10544 rather than the 10811, since there are separate
connections to pin 8 of the OCXO for oven control, and that pin is NC in the
10811.

73, Eric Lemmon WB6FLY

Flemming Larsen wrote:

> The 10811A will replace a 10544A, but not the other way around.
>
> The 10544A requires a separate connection of 11.0-13.5 volts @ 10 mA typ.,
> 15 mA max. on pins 8 (+) and 9 (gnd) for the oven control circuit.
>
> The 10811A draws a little more current for the oscillator/amplifier at
> 11.0-13.5 volts @ 30 mA typ., 40 mA max., vs. 18 mA typ., 25 mA max. for
> the 10544A, also specified at 11.0-13.5 volts.
>
> The 10811A oven circuit draws less power after warm-up, 2 W vs. 3 W for
> the 10544A, both at 20-30 volts.
>
> The 10811A/B manual mentions two other variants of the 10811A/B, the
> 10811-60101 and the 10811-60105, with slightly different spec's.
>
> I have the original data sheet (JUL 76) for the 10544A, and original
> data sheet (APR 80) and Operating and Service Manual (AUG 80) for the
> 10811A/B, if anyone needs additional information.
>
> -- Flemming Larsen,   KB6ADS
>
> ---
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---
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---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

44. [tacgps] Motorola UT+

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Thu, 22 Feb 2001 10:32:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136828-2001.02.22-09.47.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

Would you consider the Motorola UT+ to be a good choice for timing purposes
such as for use with your GPS controller?
Thanks.

John

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

45. [tacgps] Re: Motorola UT+

From: "Brooks Shera" <ebs@lanl.gov>
Date: Thu, 22 Feb 2001 11:45:22 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-136877-2001.02.22-13.00.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The best!

----- Original Message -----
From: "John K. Pringle" <jpringle@tampabay.rr.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, February 22, 2001 8:32 AM
Subject: [tacgps] Motorola UT+

> Brooks,
>
> Would you consider the Motorola UT+ to be a good choice for timing

purposes
> such as for use with your GPS controller?
> Thanks.
>
> John
>
>
>
> ---
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>

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March 2001

Original source file: tacgps.0103
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0103

1. [tacgps] GPS Rcvrs for sale

From: "Don McDougall" <punkymcd@pacbell.net>
Date: Mon, 5 Mar 2001 18:44:35
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-138994-2001.03.05-18.59.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A friend of mine has about 20 San Jose Navigation Model FV-12
12-Channel GPS Engine boards including SM-66 Antennas (High Gain)
with Low Noise amplifiers.

Quote from the Introduction page of the users manual:

"The FV-12 is a high performance 12-channel GPS engine
board that comes packed with a real time PPS timing output,
baud-rate-selectable DGPS input and NMEA 0183 output, and
nonvolitile memory onboard the engine.

Integrated with SiRF(register trade mark) technology, the FV-12
is particularly prominant for its SnapLock Signal Acquisition,
Dual Multi-Path signal Rejection and FoilageLock Signal Sensitivity,
which makes it unparalleled in current GPS markets."

The FV-12 appears to be one of the smaller GPS receivers on the
market. 71mm(L) 41mm(W) and 8mm(H)

Formats $GPGSV, $GPGSA, $GPVTG, $GPGLL, $GPGGA and $GPRMC.

He is asking $95 each which includes the FV-12 GPS receiver, an
SM-66 antenna and a User's Guide.

There are two web addresses that you could visit if interested.

The first, www.sanav.com/sm66.htm, describes the SM-66 antenna.
The second, www.sanav.com/fv-12.htm, describes the GPS module.

I have no financial interest in this item.

If anyone is interested please contact Mike Doty at the following
e-mail address.

   doty@inreach.com

73, Don, W6OA

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] GPS in a Experimental Rocket

From: "Fernando Stancato" <autosoft@sercomtel.com.br>
Date: Wed, 7 Mar 2001 12:15:42 -0300
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139519-2001.03.08-18.16.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear all

I am a Mechanical Engineer ant teacher at university. Nowadays we have a project of an experimental
rocket and we want to ad a GPS inside and transmit the information by TNC and a hand transmitter. We
already have the transceiver and we want to by a cheap GPS board (you know, sometimes the rocket
parachute do not open...)
I would thank you a lot if you could inform us where to find one suitable and cheap. Also I would like
to know if the TAPR TNC would work in this application.

Yours
Prof Fernando Stancato
Centro Politécnico
Universidade Norte do Paraná
autosoft@sercomtel.com.br
www.gfe.cjb.net

3. [tacgps] Re: GPS in a Experimental Rocket

From: W Van Buskirk <wevb@rocketmail.com>
Date: Fri, 9 Mar 2001 06:16:49 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139616-2001.03.09-08.32.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Fernando,
 I would use a PIC-E rather than a complete TNC. As I
understand you, there will only be telem coming from
the rocket, no need to boost unused hardware.
 Finding a GPS engine that fits you budget can be
challenging. Try checking E-Bay,
http://pages.ebay.com/buy/index.html
You could also check, http://www.synergy-gps.com/ They
have deals for GPS in education. I don't know the
details but it may be of help.
 Please keep the list posted on your progress, in
addition to ham radio I also enjoy sport rocketry ;-)
Good luck an 73 de Bill, KB0ODJ
--- Fernando Stancato <autosoft@sercomtel.com.br>
wrote:
> Dear all
>
> I am a Mechanical Engineer ant teacher at
> university. Nowadays we have a project of an
> experimental rocket and we want to ad a GPS inside
> and transmit the information by TNC and a hand
> transmitter. We already have the transceiver and we
> want to by a cheap GPS board (you know, sometimes
> the rocket parachute do not open...)
> I would thank you a lot if you could inform us where
> to find one suitable and cheap. Also I would like to
> know if the TAPR TNC would work in this application.
>
> Yours
> Prof Fernando Stancato
> Centro Polit□cnico
> Universidade Norte do Paran□
> autosoft@sercomtel.com.br
> www.gfe.cjb.net
>
>

=====
William E Van Buskirk
Voice:(301)241-3220
FAX:(800)306-9714
Voice mail:(800)237-5680
wevb@rocketmail.com
wevb@nfis.com
wvanbusk@mtel.com

_____
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4. [tacgps] Oncore GT change to nmea

From: "Colin whitechurch" <cwhitechurch@iform.com.au>
Date: Sat, 10 Mar 2001 19:42:4
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139907-2001.03.10-19.57.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am attempting to get nmea ot of an Oncore GT (I think)
Can anyone identify if this unit is in fact capable of nmea and if so what
is the Trick in geting into nmea mode.

The unit is fully functional in Motorola binary. Gets a fix, sends
responds to commands but refuses to change after the change to nmea
commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01   @@Ci01
or @@Ci00.
$PMOTG commands don't result in an output and the receiver will still

respond to a @@Ea00 at 9600 and output an EA message.

I have not tried a $PMOTG with a checksum but it is optional

Unit details are

Copyright 1991-1996 Motorola inc
SFTW P/N # 98-P36847P
SOFTWAREVER # 1
SOFTWARE REV 6
SOFTWARE DATE FEB 22 1997
MODEL # R1221N1114
HWDR P/N # 1
SERIAL # R00Z8L
MANUFACTURE DATE 7F12

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5. [tacgps] RE: Oncore GT change to nmea

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Sat, 10 Mar 2001 20:13:18 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139916-2001.03.10-20.31.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Get a copy of TAC32 at http://gw.cnssys.com/tac32/   Use it to switch it and
then disconnect and do what you need. Basically you go to comm port setup
and select port and nema or binary mode....

> ----------
> From: Colin whitechurch[SMTP:cwhitechurch@iform.com.au]
> Reply To: TAPR Special Interest Group
> Sent: Friday, March 09, 2001 7:00 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Oncore GT change to nmea
>
> I am attempting to get nmea ot of an Oncore GT (I think)
> Can anyone identify if this unit is in fact capable of nmea and if so what
>
> is the Trick in geting into nmea mode.
>
> The unit is fully functional in Motorola binary. Gets a fix, sends
> responds to commands but refuses to change after the change to nmea
> commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01   @@Ci01
> or @@Ci00.
> $PMOTG commands don't result in an output and the receiver will still
> respond to a @@Ea00 at 9600 and output an EA message.
>
> I have not tried a $PMOTG with a checksum but it is optional
>
> Unit details are
>
> Copyright 1991-1996 Motorola inc
> SFTW P/N # 98-P36847P
> SOFTWAREVER # 1
> SOFTWARE REV 6
> SOFTWARE DATE FEB 22 1997
> MODEL # R1221N1114
> HWDR P/N # 1
> SERIAL # R00Z8L
> MANUFACTURE DATE 7F12
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

6. [tacgps] Re: Oncore GT change to nmea

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Sat, 10 Mar 2001 18:54:53 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139921-2001.03.10-21.09.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Colin,

I have an Oncore Technical Application Note entitled, "Oncore NMEA Output,"

which opens with this statement: "The VP Oncore and GT Oncore (version 2.0 or
newer) receivers can be configured to output NMEA 0183 messages." It appears
that your receiver is version 1, so it may be that it is not capable of
providing NMEA output. I downloaded this app note from
www.oncore.motorola.com some time ago, before the GT+ receivers replaced the
GT line. I suggest that you contact synergy-gps to get a reading on the exact
model number on your unit, to be absolutely certain. Good luck!

73, Eric Lemmon WB6FLY

Colin whitechurch wrote:

> I am attempting to get nmea ot of an Oncore GT (I think)
> Can anyone identify if this unit is in fact capable of nmea and if so what
> is the Trick in geting into nmea mode.
>
> The unit is fully functional in Motorola binary. Gets a fix, sends
> responds to commands but refuses to change after the change to nmea
> commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01   @@Ci01
> or @@Ci00.
> $PMOTG commands don't result in an output and the receiver will still
> respond to a @@Ea00 at 9600 and output an EA message.
>
> I have not tried a $PMOTG with a checksum but it is optional
>
> Unit details are
>
> Copyright 1991-1996 Motorola inc
> SFTW P/N # 98-P36847P
> SOFTWAREVER # 1
> SOFTWARE REV 6
> SOFTWARE DATE FEB 22 1997
> MODEL # R1221N1114
> HWDR P/N # 1
> SERIAL # R00Z8L
> MANUFACTURE DATE 7F12
>
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---
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7. [tacgps] Re: Oncore GT change to nmea

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sat, 10 Mar 2001 22:24:48 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139945-2001.03.10-22.41.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Colin whitechurch wrote:
>
> I am attempting to get nmea ot of an Oncore GT (I think)
> Can anyone identify if this unit is in fact capable of nmea and if so what
> is the Trick in geting into nmea mode.
>
> The unit is fully functional in Motorola binary. Gets a fix, sends
> responds to commands but refuses to change after the change to nmea
> commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01   @@Ci01
> or @@Ci00.
> $PMOTG commands don't result in an output and the receiver will still
> respond to a @@Ea00 at 9600 and output an EA message.
>
> I have not tried a $PMOTG with a checksum but it is optional

$PMOTG won't work until you're in NMEA mode. If you have the gps90 (or
gps60, gps110, etc) it's 'mode nmea' and an instantaneous shift.

If you go to the TAPR web site and snag the APRS DOS distro, you'll find
a program, MOTOROLA.BAS that will (usually) set the receiver to nmea
mode. It'll show, even if you can't use it (I only have linux) the
specific command syntax for the reset.

73, gerry
--
Gerry Creager -- gerry@cs.tamu.edu

```
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```

8. [tacgps] Re: GPS in a Experimental Rocket

```
From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Sat, 10 Mar 2001 23:45:16 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139970-2001.03.11-00.42.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

Professor Stancato,

Perhaps, after our semester is over, we can talk at some length about this. I'm currently helping put telemtry using TAPR-type TNCs on a student-built sounding rocket. We will look at GPS next year, after the telemetry becomes "off-the-shelf." However, because of the dynamics and roll potential, you will either need to accommodate multiple antennas to keep the sky-view acceptable, or use multiple receivers with single antennas which multiplex their data.

I suspect it will be possible to downlink raw navigation data, and assimilate it on the ground, but I've not done that and would have to develop code (one of the long list of things I want to do) to do this.

After the end of the semester I should have some spare time to think of things like this.

Regards,
Gerry Creager
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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9. [tacgps] Re: Oncore GT change to nmea

```
From: Tom Willems <Tom.Willems@RUG.AC.BE>
Date: Sun, 11 Mar 2001 11:45:28 +0100 (MET)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-139995-2001.03.11-05.01.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

On Sat, 10 Mar 2001, Colin whitechurch wrote:

> refuses to change after the change to nmea
> commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01
> @@Ci01 or @@Ci00.
> $PMOTG commands don't result in an output

Dear Colin Whitechurch,

You will only need the $PMOTG command once that you are in NMEA mode, in order to switch back to binary mode by sending $PMOTG,FOR,0<CR><LF>.

While the checksum is not mandatory in NMEA mode, it is in the binary mode. So switching to NMEA (assuming that your Oncore supports NMEA) requires the following 8 bytes to be sent:
<40h> <40h> <43h> <69h> <01h> <2Bh> <0Dh> <0Ah>,
which is equivalent to @@Ci<01h><2Bh><CR><LF>, with <2Bh> being the XOR of the first 5 bytes.

Have fun,

-Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Re: Oncore GT change to nmea

From: info@synergy-gps.com
Date: Mon, 12 Mar 2001 08:19:34 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-140269-2001.03.12-10.35.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Colin,

Eric Lemmon hit the nail on the head in his previous post. Since
your receiver has v1.6 firmware it will only communicate in binary
mode. NMEA support was not added until v2.01. We can reflash
your unit to the latest version (v3.0) if you desire. Please contact
me offline if this is something you would like to pursue.

NOTE: Even if you have your GT upgraded to "GT+" firmware, you
will not be able to use the receiver as a rover in differential mode
using RTCM correction messages. The second serial port needed
to accomplish this was not included in hardware in the v1.6
receiver.

Best Regards,

Randy Warner
Senior Applications Engineer
Synergy Systems, LLC

----------------- Reply Separator --------------------

> I am attempting to get nmea ot of an Oncore GT (I think)
> Can anyone identify if this unit is in fact capable of nmea and if so
> what is the Trick in geting into nmea mode.
>
> The unit is fully functional in Motorola binary. Gets a fix, sends
> responds to commands but refuses to change after the change to nmea
> commans. I have tried all combinations of @@Cf @@Cg00 or @@Cg01
> @@Ci01 or @@Ci00. $PMOTG commands don't result in an output and the
> receiver will still respond to a @@Ea00 at 9600 and output an EA
> message.
>
> I have not tried a $PMOTG with a checksum but it is optional
>
> Unit details are
>
> Copyright 1991-1996 Motorola inc
> SFTW P/N # 98-P36847P
> SOFTWAREVER # 1
> SOFTWARE REV 6
> SOFTWARE DATE FEB 22 1997
> MODEL # R1221N1114
> HWDR P/N # 1
> SERIAL # R00Z8L
> MANUFACTURE DATE 7F12
>
> ---
> You are currently subscribed to tacgps as: randy@synergy-gps.com
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>
>

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11. [tacgps] Re: GPS in a Experimental Rocket

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Tue, 13 Mar 2001 21:19:55 -0500

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-250-2001.03.13-20.35.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Fernando Stancato wrote:
>
> Dear all
>
> I am a Mechanical Engineer ant teacher at university. Nowadays we have a
> project of an experimental rocket and we want to ad a GPS inside and
> transmit the information by TNC and a hand transmitter. We already have
> the transceiver and we want to by a cheap GPS board (you know, sometimes
> the rocket parachute do not open...)
> I would thank you a lot if you could inform us where to find one suitable
> and cheap. Also I would like to know if the TAPR TNC would work in this
> application.
>
> Yours
> Prof Fernando Stancato
> Centro Politécnico
> Universidade Norte do Paraná
> autosoft@sercomtel.com.br
> www.gfe.cjb.net

Pardon for being slow to answer, but I have been away on travel.

In order to give specific advice, a few questions must be asked:
  1. What is the speed of the rocket?
  2. What will be the altitude at apogee?
  3. Will the rocket be spinning, and if it is, will the antenna be on
     the "top" or on the "side"?

Questions 1 and 2 are important because ALL GPS receivers sold
commercially must adhere to COCOM Munitions rules. The applicable rule is
sometimes called the "anti-SCUD" rule and it is forbidden to sell any GPS
receiver that can operate at a speed greater than Mach 2 and at an altitude
higher than 60,000 feet. The purpose for this rule is to prohibit "bad
guys" from using commercial GPS receivers to navigate a missile. I mention
this point because your "rocket" may have many of the "missile"
characteristics.

Because of this problem, some manufacturers (especially Trimble) have a
limit switch in their receivers that triggers at a speed of ~1000 km/hr
>>OR<< an altitude of ~18 km. It has been seen in slow moving balloons that a Trimble receiver will
start to report its position as Sunnyvale, California when it passes thru ~18 km even though it moves
slowly.

Some other manufacturers (Motorola PVT6/ONCORE since firmware version 5.0,
Rockwell Jupiter) use a different test and they have worked fine in balloon
flights to over 30 km, but the receivers will not track at high speeds.

I asked question 3 because most small receivers will not work if the GPS
satellites are dropping out of view every second or two. If the rocket is
spinning and the antenna is on the side, it takes a very special type of
receiver to maintain lock!

In terms of tracking your rocket for recovery, if you use a TNC, the APRS
software will display the location on a moving map. APRS has been used by
manay amateur ballon groups to track and find their payloads.

I hope this helped a bit -- Tom Clark

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Mailing list

From: jungsp@etri.re.kr
Date: Thu, 15 Mar 2001 01:28:22 +0900
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-364-2001.03.14-10.43.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I would like to join the mailing list.
Let me know how I can do it.

JeongSook.

13. [tacgps] Re: GPS in a Experimental Rocket

From: "Fernando Stancato" <autosoft@sercomtel.com.br>
Date: Wed, 14 Mar 2001 12:10:54 -0300
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <clark@aleph.gsfc.nasa.gov>
Message-ID: <LYR6754-401-2001.03.14-12.58.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear Tom

First of all I would like to thank you and all the others that has given me so good advises and informations.

About your questions here follows the answers:

1 and 2) The rocket gets usually gets a maximum velocity of 200 m/s in 5 seconds (8gs maximum acceleration). It has an apogee of 2000 m. Although we would like to get some data from the propulsion and the cost phase the main objective is to track as it comes by parachutes at a velocity of 23 m/s.

3) We are thinking to put the antena under the nose cone. The nose cone is made of fiberglass 1,5 mm and has a 130 mm in diameter and 630 mm high. Even when it comes back by parachutes (if it depploys well....) it will come with nose come up.

I would thank you a lot if you could inform me where to find the APRS software.

Follows an photo of our rocket and the crew.

Yours

Prof Fernando Stancato
Centro Politécnico
Universidade Norte do Paraná
autosoft@sercomtel.com.br
www.gfe.cjb.net
[Attachment: 2000_11_04 SPACE com Ikonos.jpg; image/jpeg; 26,511 bytes]

14. [tacgps] Re: GPS in a Experimental Rocket

From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
Date: Wed, 14 Mar 2001 18:29:49 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TACGPS <tacgps@lists.tapr.org>
Message-ID: <LYR6754-451-2001.03.14-17.45.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Fernando Stancato wrote:

> 1 and 2) The rocket gets usually gets a maximum velocity of 200 m/s in 5
> seconds (8gs maximum acceleration). It has an apogee of 2000 m. Although we
> would like to get some data from the propulsion and the cost phase the main
> objective is to track as it comes by parachutes at a velocity of 23 m/s.

This velocity (max = 200 m/sec = 650 ft/sec = 450 mph) and altitude (2 km) certainly fall under the COCOM "Anti-SCUD" limits so my legal concern is no problem. I have see Motorola ONCORE and Garmin handheld receivers work fine in commercial aircraft at speeds ~1.5 times as fast while flying at 10-12 km altitude. It will be necessary to look at the receiver specs to see if the 8g "jerk" acceleration will cause problems with any of the tracking loops in the receiver. You will want to have the receiver locked up for a [Randy/Art @ Synergy -- can you comment on the acceleration specs for the UT+ & GT rcvrs? Can the software dynamics switch help?]

> 3) We are thinking to put the antena under the nose cone. The nose cone is
> made of fiberglass 1,5 mm and has a 130 mm in diameter and 630 mm high. Even
> when it comes back by parachutes (if it depploys well....) it will come with
> nose come up.

Good! That thin fibreglass should be a good radome. But don't paint it!

> I would thank you a lot if you could inform me where to find the APRS
> software.

Check TAPR at http://www.tapr.org/ where you will see a button that says "Latest APRS software". TAPR's FTP site has APRS for MSDOS, Windows, Mac and even Palm Pilot. TAPR has an APRS Email reflector where you can find an ifininite number of instant experts who can help you. Bob Bruninga,

WB4APR is the originator of APRS and he monitors the TACGPS reflector. I
bet he will answer your questions directly!

Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: GPS in a Experimental Rocket

From: info@synergy-gps.com
Date: Wed, 14 Mar 2001 16:06:24 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-456-2001.03.14-18.22.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom/Fernando,

I would certainly expect to see some problems at max
acceleration. The GT+ we sent to Fernando (along with the other
Motorola receivers) are all rated for a max acceleration of 4 G's,
and max jerk of 5 X 10 E3 M/S. While I don't have any personal
experience with using the receivers at such a high G load, from
what I understand from Motorola, the crystal that controls the
tracking oscillator will flex under excessive load, causing the
oscillator to drift, coming back to where it belongs once the initial
acceleration bleeds off. (Tom - have any contacts at Wallops Island
who would be willing to share their experiences.....?)

Randy

----------------- Reply Separator --------------------

> Fernando Stancato wrote:
>
> > 1 and 2) The rocket gets usually gets a maximum velocity of 200 m/s
> > in 5 seconds (8gs maximum acceleration). It has an apogee of 2000
> > m. Although we would like to get some data from the propulsion and
> > the cost phase the main objective is to track as it comes by
> > parachutes at a velocity of 23 m/s.
>
> This velocity (max = 200 m/sec = 650 ft/sec = 450 mph) and altitude (2
> km) certainly fall under the COCOM "Anti-SCUD" limits so my legal
> concern is no problem. I have see Motorola ONCORE and Garmin handheld
> receivers work fine in commercial aircraft at speeds ~1.5 times as
> fast while flying at 10-12 km altitude. It will be necessary to look
> at the receiver specs to see if the 8g "jerk" acceleration will cause
> problems with any of the tracking loops in the receiver. You will want
> to have the receiver locked up for a [Randy/Art @ Synergy -- can you
> comment on the acceleration specs for the UT+ & GT rcvrs? Can the
> software dynamics switch help?]
>
> > 3) We are thinking to put the antena under the nose cone. The nose
> > cone is made of fiberglass 1,5 mm and has a 130 mm in diameter and
> > 630 mm high. Even when it comes back by parachutes (if it depploys
> > well....) it will come with nose come up.
>
> Good! That thin fibreglass should be a good radome. But don't paint
> it!
>
> > I would thank you a lot if you could inform me where to find the
> > APRS software.
>
> Check TAPR at http://www.tapr.org/ where you will see a button that
> says "Latest APRS software". TAPR's FTP site has APRS for MSDOS,
> Windows, Mac and even Palm Pilot. TAPR has an APRS Email reflector
> where you can find an ifininite number of instant experts who can help
> you. Bob Bruninga, WB4APR is the originator of APRS and he monitors
> the TACGPS reflector. I bet he will answer your questions directly!
>
> Tom
>
> ---
> You are currently subscribed to tacgps as: randy@synergy-gps.com
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>
>

Synergy Systems, LLC P.O. Box 262250, San Diego, CA 92196
Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
 lat N 32.54' 43.9612 Lon W 117 06' 41.8060
Motorola's leading ONCORE GPS Distributor in the Americas

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16. [tacgps] Re: GPS in a Experimental Rocket

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Wed, 14 Mar 2001 23:28:20 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-543-2001.03.14-22.44.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Randy @ Synergy wrote:
> [snip] The GT+ we sent to Fernando (along with the other
> Motorola receivers) are all rated for a max acceleration of 4 G's,
> and max jerk of 5 X 10 E3 M/S. While I don't have any personal
> experience with using the receivers at such a high G load, from
> what I understand from Motorola, the crystal that controls the
> tracking oscillator will flex under excessive load, causing the
> oscillator to drift, coming back to where it belongs once the initial
> acceleration bleeds off.

My gut feeling is that the actual change of the crystal oscillator when a
receiver is jolted is much less important than the ability of the
carrier/code phase tracking loops to track satellites without losing lock.
Of course the "G" specification is intended to cover both effects.

The Code/Carrier tracking loops have their (in firmware, probably
implemented with a Kalman filter) low-pass filters tuned to optimize
(receiver sensitivity) vs. (dynamic performance) vs. (dropout tolerance)
vs. (lockup time) characteristics for the conditions that the manufacturer
perceives are most relevant to commercial customers. Motorola optimized the
GT+ for vehicular tracking in the presence of foliage and concrete "urban
canyon" environments. The VP had a five (I seem to remember) position
dynamics "switch" (plus the unadvertised "foliage filters") to allow the
user some ability to adjust these loops for his own conditions.

I don't know if similar "dynamics switch" capabilities exist in the GT+ (or
the UT+ or the new M12). The best way to test the performance would be to
simulate a rocket flight with a GPS simulator, but I cannot offer any
suggestions as to where such a test could be run in Brazil (but I bet that
the simulator exists in the INPE labs in San Jose dos Campos).

Tom

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17. [tacgps] GPS receivers for sale

From: punkymcd@pacbell.net
Date: Fri, 16 Mar 2001 16:04:24 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: doty@inreach.com, doty1@llnl.gov
Message-ID: <LYR6754-958-2001.03.16-18.20.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Re-run of an earlier posting with address and phone number added and
additionally an evaluation kit.

A friend of mine has about 20 San Jose Navigation Model FV-12 12-Channel

GPS Engine boards which include SM-66 Antennas (High Gain) with Low
Noise
amplifiers and users manual.

Quote from the Introduction page of the users manual:

"The FV-12 is a high performance 12-channel GPS engine
board that comes packed with a real time PPS timing output,

baud-rate-selectable DGPS input and NMEA 0183 output, and
nonvolatile memory onboard the engine.

Integrated with SiRF(register trade mark) technology, the FV-12
is particularly prominent for its SnapLock Signal Acquisition,
Dual Multi-Path signal Rejection and FoilageLock Signal Sensitivity,
which makes it unparalleled in current GPS markets."

The FV-12 appears to be one of the smaller GPS receivers on the
market. 71mm(L) 41mm(W) and 8mm(H)

Formats $GPGSV, $GPGSA, $GPVTG, $GPGLL, $GPGGA and $GPRMC
             Others as well.

He is asking $95 each which includes the FV-12 GPS receiver, an
SM-66 antenna and a User's Guide.

Additionally he has a few FV-12s with evaluation Kit Board. Thest units
are mounted
in an extruded aluminum box with a DB9 RS232 I/O, DG9 DGPS input, 12VDC
power supply, 1pps output pulse on a BNC connector. Asking price on this

setup
is $200.

There are two web addresses that you could visit if interested.

The first, www.sanav.com/sm66.htm, describes the SM-66 antenna.
The second, www.sanav.com/fv-12.htm, describes the GPS module.

I have no financial interest in this item.

If anyone is interested please contact Mike Doty at the following
e-mail address.

   doty@inreach.com

Otherwise he can be reached at this address or evenings at his telephone

number.

Mike Doty
1424 Claremont Dr.
Manteca Ca. 95336
(209)823-6501

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18. [tacgps] TNC to receave the data

From: "Fernando Stancato" <autosoft@sercomtel.com.br>
Date: Fri, 2 Mar 2001 10:30:46 -0300
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1381-2001.03.19-07.46.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear all

Thanks for the informations sent we have set how to transmit the GPS informations inside the rocket. We will use a MIM TNC to send also some other telemetries. Now I wold thank you a lot some suggestions on what to use to receave the data. To receave the data we will use an ICOM ICR1 (just receaver) with phone plug.

Prof Fernando Stancato
Centro Politécnico
Universidade Norte do Paraná
autosoft@sercomtel.com.br
www.gfe.cjb.net

19. [tacgps] Re: TNC to receave the data

From: "Tom Clark (W3IWI)" <clark@aleph.gsfc.nasa.gov>
Date: Mon, 19 Mar 2001 13:59:45 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1423-2001.03.19-13.15.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Fernando Stancato wrote:
>

> Dear all
>
> Thanks for the informations sent we have set how to transmit the GPS
> informations inside the rocket. We will use a MIM TNC to send also some
> other telemetries. Now I wold thank you a lot some suggestions on what to
> use to receave the data. To receave the data we will use an ICOM ICR1
> (just receaver) with phone plug.
>
> Prof Fernando Stancato
> Centro Politécnico
> Universidade Norte do Paraná
> autosoft@sercomtel.com.br
> www.gfe.cjb.net

Fernando, you might want to consider using a Kenwood TH-D7A on the ground.
This is a batterhy-powered handheld radio with a TNC built in. It costs
about $400 US. Take a look at http://www.kenwood.net/ama_page.cfm for
details.

Tom

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20. [tacgps] Question

From: "Russ Chadwick" <crb5@qwest.net>
Date: Wed, 21 Mar 2001 07:01:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1909-2001.03.21-08.16.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Is there an easy way to take GPS readings and get them into an Excel
spreadsheet. This seems like an application that should be widely
available, but I'm not aware of anything that does this. The use is GPS
mapping of watershed features and the people who are going to do this would
like to avoid using pencil and paper to get their data from the field into
their database. They specifically want to use Excel spreadsheets.

Russ
kb0tvj

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] RE: Question

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 21 Mar 2001 09:04:05 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1929-2001.03.21-09.21.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

TAC32 can generate CVS format which will import into Excel.

> ----------
> From: Russ Chadwick[SMTP:crb5@qwest.net]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, March 21, 2001 8:01 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Question
>
> Is there an easy way to take GPS readings and get them into an Excel
> spreadsheet. This seems like an application that should be widely
> available, but I'm not aware of anything that does this. The use is GPS
> mapping of watershed features and the people who are going to do this
> would
> like to avoid using pencil and paper to get their data from the field into
> their database. They specifically want to use Excel spreadsheets.
>
> Russ
> kb0tvj
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

22. [tacgps] RE: Question

From: "Unden, Jamie" <james.unden@baesystems.com>
Date: Wed, 21 Mar 2001 07:07:15 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1930-2001.03.21-09.23.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have done this using the TAC32 software. Create a log file, then import
it into Excel as a text file.

Jamie Unden
 BAE SYSTEMS Controls Inc.
Software Engineering Specialist
1930 S. Vineyard Ave.
Box 50,000
Ontario, CA 91761
(909)947-7600 x4388
james.unden@baesystems.com

> ----------
> From: Russ Chadwick [SMTP:crb5@qwest.net]
> Sent: Wednesday, March 21, 2001 6:01 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Question
>
> Is there an easy way to take GPS readings and get them into an Excel
> spreadsheet. This seems like an application that should be widely
> available, but I'm not aware of anything that does this. The use is
GPS
> mapping of watershed features and the people who are going to do
this would
> like to avoid using pencil and paper to get their data from the
field into
> their database. They specifically want to use Excel spreadsheets.
>
> Russ
> kb0tvj
>
> ---
> You are currently subscribed to tacgps as:
Jamie.Unden@marconiastronics.com
> To unsubscribe send a blank email to
leave-tacgps-6754G@lists.tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] Re: Question

From: Dave Martindale <davem@cs.ubc.ca>
Date: Wed, 21 Mar 2001 09:12:31 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-1953-2001.03.21-11.33.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 07:01 21/03/01 -0700, you wrote:
>Is there an easy way to take GPS readings and get them into an Excel
>spreadsheet. This seems like an application that should be widely
>available, but I'm not aware of anything that does this.

If you're willing to do a bit of work yourself, I have a Perl script
that does most of the work. First you simply log the NMEA output of
a GPS receiver to a file using a terminal emulator on a PC or Mac, or
any other data logger that captures the data stream verbatim. Then you
run the data through my Perl program, which collects all the data from
a single "data burst" and puts it onto a single line, making it easy to
import into Excel. It also converts latitude and longitude from NMEA's
DDDMM.MMM format, which Excel will (incorrectly) read as a decimal number,
into pure decimal degrees which Excel can read correctly.

You can get a copy of this Perl program from
http://vancouver-webpages.com/pub/peter/idx_nmeaprog.html ; look for
"nmea.perl". As written, it handles exactly the set of NMEA sentences
from some particular 12-channel Garmin receiver, but it should be easy
to modify it for the output of different units. You'll also need a Perl
interpreter, but these are available as pre-compiled executables for most

currently-used computer types; look at www.perl.org to find one for your
machine.

        Dave

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24. [tacgps] NIST F1

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 24 Mar 2001 05:56:58 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-2605-2001.03.24-05.13.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For the benefit of fellow time and frequency phreques, I mention:

1. A "how it works" feature article on P. 46 of the 15 March, 2001 issue
of EDN, which refers you to.

2. http://www.boulder.nist.gov/timefreq/cesium/fountain.htm There you
find some interesting information
   about this remarkable clock (uncertainty 2 * E-15) including a cute
little .mpg video illustrating its   operation. Nice site to visit.

        Bob Smith

--

--------- Avoid computer viruses -- Practice safe hex -------------
 * * Specializing in small, cost effective embedded control systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: Question

From: "Marius Hauki" <Marius.Hauki@datarespons.no>
Date: Mon, 26 Mar 2001 11:23:40 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-2871-2001.03.26-03.39.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HI Russ and the list :

Excel has Visual Basic for Applications built in.
It is possible to write an application for this.
You would need to call a DLL that can handle serial
communications. Several are available. I think one can be found at
Microsofts site. You could alternatively check out the
European Magazine Elektor Electronics. They have written a series of articles in late 2000
and early 2001 about serial comms and VB ! I think the website is www.elektor.com

73 de LA9EEA
Marius Hauki

Russ Chadwick wrote:
>
> Is there an easy way to take GPS readings and get them into an Excel
> spreadsheet. This seems like an application that should be widely
> available, but I'm not aware of anything that does this. The use is GPS
> mapping of watershed features and the people who are going to do this would
> like to avoid using pencil and paper to get their data from the field into
> their database. They specifically want to use Excel spreadsheets.
>
> Russ
> kb0tvj
>
> ---
> You are currently subscribed to tacgps as: MARIUS@DATARESPONS.NO
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Re: Question

From: Gerry Creager n5jxs <gerry@cs.tamu.edu>
Date: Mon, 26 Mar 2001 08:20:07 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-2896-2001.03.26-08.37.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Anothr approach is to build a template file with the conversion
algorithms already built in, and then import NMEA data into the
spreadsheet. This is fairly painless, as well. A 3rd method is a
2-step process: Write a basic/VB/C/[insert language preference here]
program to act as a small GPS/terminal program, where logged data is
pre-converted to cvs format. I've done this several times. I have to
go looking for bits, but I might be able to find them, or bits that do
something very similar.

Gerry
--
Marius Hauki wrote:
>
> HI Russ and the list :

>
> Excel has Visual Basic for Applications built in.
> It is possible to write an application for this.
> You would need to call a DLL that can handle serial
> communications. Several are available. I think one can be found at
> Microsofts site. You could alternatively check out the
> European Magazine Elektor Electronics. They have written a series of articles in late 2000
> and early 2001 about serial comms and VB ! I think the website is www.elektor.com
>
> 73 de LA9EEA
> Marius Hauki
--
> Russ Chadwick wrote:
> >
> > Is there an easy way to take GPS readings and get them into an Excel
> > spreadsheet. This seems like an application that should be widely
> > available, but I'm not aware of anything that does this. The use is GPS
> > mapping of watershed features and the people who are going to do this would
> > like to avoid using pencil and paper to get their data from the field into
> > their database. They specifically want to use Excel spreadsheets.
> >
> > Russ
> > kb0tvj
> >
> > ---
> > You are currently subscribed to tacgps as: MARIUS@DATARESPONS.NO
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering |Research focusing on
Academy for Advanced Telecommunications |Satellite Geodesy and
and Learning Technologies |Geodetic Control
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: Question

From: "Russ Chadwick" <crb5@qwest.net>
Date: Tue, 27 Mar 2001 06:31:54 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3062-2001.03.27-07.48.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks to all of you who have sent answers to the question (below) that I
posed last week. I have forwarded all of your suggestions to my friend who
hopes to do a GPS survey of a watershed in the Shanadoha Valley in Virginia.
He wants to locate all of the "improvments" (bridges, culverts, etc.) in a
certain river and its tributaries. He said to thank you all for your
efforts. You have given him much food for thought.

Russ   KB0TVJ
Boulder, CO
http://www.users.qwest.net/~crb5/

----- Original Message -----
From: Russ Chadwick <crb5@qwest.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Wednesday, March 21, 2001 7:01 AM
Subject: [tacgps] Question

> Is there an easy way to take GPS readings and get them into an Excel
> spreadsheet. This seems like an application that should be widely
> available, but I'm not aware of anything that does this. The use is GPS
> mapping of watershed features and the people who are going to do this
would
> like to avoid using pencil and paper to get their data from the field into
> their database. They specifically want to use Excel spreadsheets.
>
> Russ
> kb0tvj
>

>
> ---
> You are currently subscribed to tacgps as: crb5@uswest.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] An Invitation from the Asia-Pacific Rim

From: "APEC" <apec@chinanusa.com>
Date: Wed, 28 Mar 2001 17:54:36 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3671-2001.03.29-19.26.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

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* On-site public relation facilitation, media coverage
* Collateral translation
* Escort interpretation
* Leisure touring in Suzhou and its vacinities

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* Biotechnology
* Environmental and cleaner production technologies

```
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*       Information technologies / electronics
*       Advanced materials
*       Mechatronics
*       Transportation
*       Resource management technology
*       Energy
*       Sustainable agriculture
*       Emergency preparedness and climate     prediction
*       Exploitation of natural resources

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```

29. [tacgps] Re: An Invitation from the Asia-Pacific Rim

```
From: "Steve Sampson" <k5okc@home.com>
Date: Thu, 29 Mar 2001 19:21:15 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3686-2001.03.29-19.37.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hey, I should go!  My Uncle died in Shanghai in 1936.
As a French Army conscript, he was stabbed in the back,
and died there.  I have a nice photo of the headstone...

Too bad they're just a bunch of lousy Chicom's though...

----- Original Message -----


          Aiming at Asia-Pacific Market?
          Here's your one and only chance this year to target
          21 developed and developing member economies in the Asia-Pacific rim.
```

30. [tacgps] Fixing the recent SPAM

```
From: "Steven R. Bible" <srbible@gate.net>
Date: Fri, 30 Mar 2001 07:48:23 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3790-2001.03.30-09.04.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Folks,

In light of the recent spam on this list, I've configured the list to accept
"members only" submissions.  This means that when you post to the list the
listserver will check that the FROM email address on your email as someone
who is subscribed to the list.  The difficultly of this mode for some is
```

posting from another email account or changing ISPs. The email address the
you are subscribed to the list is in the footer of the message. And
remember, you can administer your personal account from

   http://www.tapr.org/cgi-bin/lyris.pl?site=tapr

 - Steve, N7HPR
   n7hpr@tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] RE: Fixing the recent SPAM

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Fri, 30 Mar 2001 09:25:48 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3803-2001.03.30-09.42.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks !

> ----------
> From: Steven R. Bible[SMTP:srbible@gate.net]
> Reply To: TAPR Special Interest Group
> Sent: Friday, March 30, 2001 8:48 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Fixing the recent SPAM
>
> Folks,
>
> In light of the recent spam on this list, I've configured the list to
> accept
> "members only" submissions. This means that when you post to the list the
> listserver will check that the FROM email address on your email as someone
> who is subscribed to the list. The difficultly of this mode for some is
> posting from another email account or changing ISPs. The email address
> the
> you are subscribed to the list is in the footer of the message. And
> remember, you can administer your personal account from
>
>   http://www.tapr.org/cgi-bin/lyris.pl?site=tapr
>
> - Steve, N7HPR
>   n7hpr@tapr.org
>
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

32. [tacgps] Re: Fixing the recent SPAM

From: Dr Thomas A Clark <clark@aleph.gsfc.nasa.gov>
Date: Fri, 30 Mar 2001 16:27:36 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3827-2001.03.30-10.44.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve Bible wrote:

> In light of the recent spam on this list, I've configured the list to accept
> "members only" submissions. This means that when you post to the list the
> listserver will check that the FROM email address on your email as someone
> who is subscribed to the list. The difficultly of this mode for some is
> posting from another email account or changing ISPs.

This is particularly inconvenient for me. I normally have Email come in
to one account
(at NASA/GSFC), keep a couple of mail boxes synched, and reply from home
(for me, this is especially desirable when I am away on travel). Is
there any way that those of us with problems like this can have a "post
from" (i.e. write-only) address in addition to the more normal "send to"
type of address?

Personally, I get quite a bit of SPAM and solve the problem by rapidly

exercising the [delete] key. My vote, for whatever its worth, is to not
use such filters.

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: Fixing the recent SPAM

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 30 Mar 2001 11:41:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-3828-2001.03.30-10.58.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I administer an Army MARS email list that is closed in this fashion for
OPSEC reasons. Here I accomodate subscribers with multiple accounts by
permitting multiple subscriptions from their various account addresses.
They get a copy of each posting delivered to each location. The number
of users that need this service is small, so very little excess mail is
created.

If the TAPR list server has no such capability, check your setup options
or consider a different list server.

        73, de bob, wa4ypv

Dr Thomas A Clark wrote:
>
> Steve Bible wrote:
>
> > In light of the recent spam on this list, I've configured the list to accept
> > "members only" submissions. This means that when you post to the list the
> > listserver will check that the FROM email address on your email as someone
> > who is subscribed to the list. The difficultly of this mode for some is
> > posting from another email account or changing ISPs.
>
> This is particularly inconvenient for me. I normally have Email come in
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> (at NASA/GSFC), keep a couple of mail boxes synched, and reply from home
> (for me, this is especially desirable when I am away on travel). Is
> there any way that those of us with problems like this can have a "post
> from" (i.e. write-only) address in addition to the more normal "send to"
> type of address?
>
> Personally, I get quite a bit of SPAM and solve the problem by rapidly
> exercising the [delete] key. My vote, for whatever its worth, is to not
> use such filters.
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

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Robert L. (Bob) Smith   Smith Machine Works, Inc.
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landline   804/745-1065   Richmond, Virginia 23236+1004

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April 2001

Original source file: tacgps.0104
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0104

1. [tacgps] Help with DGPS, Garmin GPS-25 and TAC-2

From: "Peter Miller" <peter_miller51@hotmail.com>
Date: Wed, 4 Apr 2001 21:31:33
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-4941-2001.04.04-21.48.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

I have seen questions and answers close to this but I still need a bit of help.

I have built a TAC-2 using a Garmin GPS-25 LVC Receiver and it works great. However, the GPS-25 has a second serial port. I would like to be able to send DGPS corrections to the GPS-25 on the second serial port. Alternatively I would like to be able to receive the carrier phase data from the second serial port.

I do not quite understand the steps necessary to tweak the TAC-2 for this situation.

The GPS-25 that I have has TTL level ports (not RS-232 level ports) although I don't believe this will be an issue.

Thanks in advance for any help.

Peter Miller

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] GPS and instrument data stream

From: Bob Staley <BobS@Zonge.com>
Date: Fri, 6 Apr 2001 09:22:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-5279-2001.04.06-11.45.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has any one seen a small handheld computer with two serial ports which can take data from a GPS and some other RS-232 instrument and merge the datastreams for recording both position and data at a point in time and space. This would be used on both a walking survey and possibly waterborne surveys. It would be preferable to be able to do so with minimal software development. The data would be postprocessed for differential corrections. I know there are some magnetometers which already have built in gps recording, but looking to use with older mags and higher precision GPS units.
Thanks
Bob Staley

Zonge Engineering and Research Organization
http://www.zonge.com
3322 E. Ft. Lowell Rd.
Tucson, AZ 85716
(520) 327-5501
Fax: (520) 325-1588

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3. [tacgps] Re: GPS and instrument data stream

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Fri, 6 Apr 2001 09:29:55 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-5280-2001.04.06-11.47.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I know that Trimble makes this kind of instrument. It is used for surveying.

73s,

Jeffrey Pawlan, WA6KBL

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Network time standardization

From: "Charles Dapples" <ccdapple@wtp.net>
Date: Fri, 13 Apr 2001 13:15:31
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-6726-2001.04.13-13.32.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have been running Tardis 2000 on my Windows 2000 network to keep all the
computers time the same. Now the network has been switched to Linux and I
am wondering if there is a similar program to Tardis that I can run under
Linux to synchronize the computers' system time?
BTW, I know very little about linux and will need help in getting programs
installed and running -- thanks!

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: Network time standardization

From: GS <gsanders1@bigfoot.com>
Date: Fri, 13 Apr 2001 15:22:49 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-6742-2001.04.13-14.40.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Charles Dapples wrote:
>
> I have been running Tardis 2000 on my Windows 2000 network to keep all the
> computers time the same. Now the network has been switched to Linux and I
> am wondering if there is a similar program to Tardis that I can run under
> Linux to synchronize the computers' system time?
> BTW, I know very little about linux and will need help in getting programs
> installed and running -- thanks!

Look for the package called XNTP, "Network Time Protocol". More than likely,
depending on which Linux distribution you are using, it probably is on the
distro, but may not be installed by default.

It can be driven directly by the GPS receiver through a serial port
on your Linux box, or it can sync to a remote time source via the
internet.

It can act as a time server or just keep it's own PC's time accurate,
depending on how it's set up.

If you're a novice at Linux like me it can be a bit of a bear to
get going with GPS initially, but once it's running it acts like
most other Linux apps - it just runs forever without tinkering.

Gary Sanders
WB0BZR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re: Network time standardization

From: John Ackermann N8UR <jra@febo.com>
Date: Fri, 13 Apr 2001 17:15:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-6754-2001.04.13-16.32.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The "standard" Linux (*nix, actually) timekeeping system is Network Time
Protocol, or ntp. Most of the Linux distributions include it. It can
receive time from servers, provide time to other servers, and get time from
hardware like GPS or WWVB clocks. Assuming you're installing from a
package under Debian, Red Hat, etc., all you should need to do is edit the
/etc/ntp.conf file to add the address of the servers you want to sync to,
and you should be all set. (It can get a lot more complicated than that,
but it doesn't have to.)

73,
John N8UR
jra@febo.com

--On Friday, April 13, 2001 1:15 PM +0000 Charles Dapples
<ccdapple@wtp.net> wrote:

> I have been running Tardis 2000 on my Windows 2000 network to keep all
> the computers time the same. Now the network has been switched to Linux
> and I am wondering if there is a similar program to Tardis that I can
> run under Linux to synchronize the computers' system time?
> BTW, I know very little about linux and will need help in getting
> programs installed and running -- thanks!
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Old Motorola Carrier Phase Receivers

From: randy@synergy-gps.com
Date: Fri, 13 Apr 2001 14:47:16 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-6764-2001.04.13-17.04.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Found during this week's physical inventory of our stockroom:

7 ea   Brand new (maybe a little dusty...) 6 Channel Motorola VP
      receivers w/ v6.0 firmware
         P/N B2122Z1112 with Carrier Phase, 1PPS, TRAIM, etc.

These were apparently an interim receiver between the "B1" 6
channel VP and the "B3" 8 channel VP. I am currently testing
them to make sure they all work properly, and they will then be
offered on a first come, first served basis to TAPR members at $75
each. Throw in an extra $10 per receiver and I will reflash them to
the most recent 6 channel firmware (v8.4).

Please respond off-line as I don't want to clutter up the newsgroup.

Thanks,

Randy Warner
Senior Applications Engineer
randy@synergy-gps.com

Synergy Systems, LLC P.O. Box 262250, San Diego, CA 92196
Voice (858) 566-0666 Toll Free 888 479-6749
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8. [tacgps] New Toy -> Garmin eTrex Vista

From: "Eric A. Cottrell" <eac@shore.net>
Date: Mon, 16 Apr 2001 20:18:39 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-7305-2001.04.16-20.36.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

It is not like I do not have alot of GPS receivers but when the RS-232 TX
driver went bad in my old trusty Garmin 12XL I decided to get a new unit with
built-in Map capability.

I have seen the Color Street Pilot in action but did not like the lack of
endurance on batteries. I also did not like the extra money to get memory
for the eMap. I noticed that Garmin has some new units in the eTrex line
with two of them (Legend and Vista) having built-in Memory to store maps.

The Legend has 8 Megs of Memory and the Vista 24 Megs (with a Flux-Gate
Compass and an Altimeter to boot!) so I searched about 5 or 6 stores before
I grabbed the last Vista at EMS!

So far it is neat with a good resolution screen. I turned on the WAAS
feature and after searching for 5 or 10 minutes it locked onto number 35.
It took awhile longer for it to properly position number 35 and awhile
longer for differental data to be display. I got errors of 14 feet with
occassional 11 feet.

73 Eric eac@shore.net WB1HBU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] RE: New Toy -> Garmin eTrex Vista

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 18 Apr 2001 03:48:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-7633-2001.04.18-04.06.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I read that Garmin was going to put WAAS into there receivers - Do you know
which models have it ?

> ----------
> From: Eric A. Cottrell[SMTP:eac@shore.net]
> Reply To: TAPR Special Interest Group
> Sent: Monday, April 16, 2001 8:18 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] New Toy -> Garmin eTrex Vista
>
> Hello,
>
> It is not like I do not have alot of GPS receivers but when the RS-232 TX
> driver went bad in my old trusty Garmin 12XL I decided to get a new unit
> with
> built-in Map capability.
>
> I have seen the Color Street Pilot in action but did not like the lack of
> endurance on batteries. I also did not like the extra money to get memory
> for the eMap. I noticed that Garmin has some new units in the eTrex line
> with two of them (Legend and Vista) having built-in Memory to store maps.
>
> The Legend has 8 Megs of Memory and the Vista 24 Megs (with a Flux-Gate
> Compass and an Altimeter to boot!) so I searched about 5 or 6 stores
> before
> I grabbed the last Vista at EMS!
>
> So far it is neat with a good resolution screen. I turned on the WAAS
> feature and after searching for 5 or 10 minutes it locked onto number 35.
> It took awhile longer for it to properly position number 35 and awhile
> longer for differental data to be display. I got errors of 14 feet with
> occassional 11 feet.
>
> 73 Eric eac@shore.net WB1HBU
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

10. [tacgps] RE: New Toy -> Garmin eTrex Vista

From: "Eric A. Cottrell" <eac@shore.net>
Date: Wed, 18 Apr 2001 21:01:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-7781-2001.04.18-21.18.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> "Kirby, Brian" wrote:
>
> I read that Garmin was going to put WAAS into there receivers - Do you know
> which models have it ?

Hello,

The product comparisons have a WAAS item. With the eTrex it seems only
the Venture, Legend, and Vista have it (Basically ones with built-in
memory). I have seen press releases that some of the newer aviation units
will get it or have it already.

I read more about WAAS today and it is an interesting system. The thing I
have noticed is that it seems very easy to break lock on the WAAS satellite.
I am traveling in an urban setting.

73 Eric eac@shore.net WB1HBU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] PACK*BASH at the 2001 Dayton Hamvention

From: John Ackermann N8UR <jra@febo.com>
Date: Mon, 23 Apr 2001 19:17:42 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-8770-2001.04.23-18.36.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

** ** **

Yes, there will be a PACK*BASH this year! Things were a bit uncertain for
a while as we just learned that our traditional site would not be available
this year. But we've found a very good alternative, and we invite you to
attend the 2001 PACK*BASH.

If you'd like to attend, please contact the TAPR office as described below.

What?
        An event for the digitally-inclined ham, featuring:
        * Buffet dinner
        * Keynote Address (Speaker to be named)
        * TAPR special interest group meetings
        * "Birds of a Feather" gatherings

When?
        Friday evening, May 18, 2001
        Doors open at 7:00 pm; dinner served at 7:30 pm
        Speaker and meetings after dinner

Where?
        *** NEW LOCATION ***
        The NCR "Sugarcamp" facility that we've used in the past is no
longer
        available. Instead, we'll be at Kohler's Banquet Center, 4548
        Presidential Way, Kettering (39 40.75N, 84 08.43W), just south of
        East David Road between Far Hills Ave. and Wilmington Pike.
        Maps available on the TAPR web site (www.tapr.org) or at the
        TAPR booth.

How?
        Dinner requires advance registration and payment through TAPR.
        Tickets will be available at the TAPR booth on Friday, though
        we strongly encourage registration <before> Hamvention. The cost
        is $25.00 per person, tax and tip included.

        All amateurs are welcome to attend, enjoy the speaker, and
        particpate in the meetings, although only those purchasing a dinner
        can eat.

To register, contact:
PACK*BASH
c/o TAPR
8987-309 E. Tanque Verde Road #337
Tucson, AZ 85749-9399

Phone: (940) 383-0000
Fax: (940) 566-2544
Internet: tapr@tapr.org

Visa/Mastercard Accepted

Who?
PACK*BASH is co-sponsored by TAPR -- Tucson Amateur Packet Radio, the national leader in digital communication -- and the Miami Valley FM Association, Dayton's packet radio club.

For more information (including maps), go to
http://www.tapr.org/tapr/html/dayton.html, or send email to tapr@tapr.org.

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May 2001

Original source file: tacgps.0105
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0105

1. [tacgps] Pins for a Garmin 20

From: "Petz, Michael" <MPetz@stlcc.cc.mo.us>
Date: Wed, 2 May 2001 14:01:05 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-10412-2001.05.02-14.21.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am looking for four or five pins for the Garmin 20 GPS engine. I have the
connector, but short a few pins.

Michael Petz
KA9HNT
mpetz@stlcc.cc.mo.us

2. [tacgps] GPS Antenna/Downconverter

From: "Douglas N. Baker" <dbengineering@compuserve.com>
Date: Tue, 15 May 2001 16:54:17
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-12896-2001.05.15-17.12.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anyone know where I might be able to purchase one of the old GPS
downconverter antennas? Several manufacturers made them, Austron (now
Datum) model 2029 or Allen Osbourne (don't know their model number), etc.
Most of them worked by feeding 10 or 50 MHz up to the antenna where it
multiplied up to 1500 MHz and mixed, then the mixer output is 75.42 MHz.
Please contact me direct if you have information and not clutter up the
TAPR email messages...Thanks
Doug, K4CLE, email: dbengineering@compuserve.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] di accompagnamento N _____004___ del ___24/06/99_____

From: Giorgio <giorgio@mgd.it>
Date: Wed, 16 May 2001 23:25:38 +0200 (added by postmaster@mail.tiscalinet.it)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-13142-2001.05.16-16.44.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

L.Via   ViaVia G. di Vittorio 5/40CAP   Località
Prov.CAP   Località   Prov.50145   Firenze
                         FIPersona da contattarePersona da contattareSig. CeriRiferimenti   :.
[Attachment: UNREGASF.EXE; application/octet-stream; 102,400 bytes]

4. [tacgps] VIRUS ALERT>>>>Re: di accompagnamento N _____004___ del ___24/06/99_____

From: Doug Bade <doug@clecom.com>
Date: Wed, 16 May 2001 17:34:41 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-13144-2001.05.16-16.53.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The last message is a VIRUS.. Norton AV caught it here.. DO NOT OPEN
.................Doug Bade

At 11:25 PM 5/16/01 +0200, you wrote:
>Content-Type: text/plain; charset=ISO-8859-1
>X-MIME-Autoconverted: from 8bit to quoted-printable by tapr.org id QAA08988
>
>L.Via   ViaVia G. di Vittorio
>5/40CAP   Località   Prov.CAP
 >   Località   Prov.50145   Firenze
 >   FIPersona da contattarePersona da contattareSig.
>eriRiferimenti   :.

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] _____04___ del ___03/02/2000_____ Destinatari

From: Giorgio <giorgio@mgd.it>
Date: Thu, 17 May 2001 02:43:36 +0200 (added by postmaster@mail.tiscalinet.it)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-13177-2001.05.16-20.04.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

L.Via   ViaVia G. di Vittorio 5/40CAP   Località
Prov.CAP   Località   Prov.50145   Firenze
                         FIPersona da contattarePersona da contattareSig. CeriRiferimenti   :.
[Attachment: IDLE32.EXE; application/octet-stream; 57,344 bytes]
[Attachment: DC5.DOC; application/octet-stream; 65,536 bytes]

6. [tacgps] PCB for GPS project

From: Ian Roberts <ITR@Nanoteq.co.za>
Date: Thu, 24 May 2001 08:35:10 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14467-2001.05.24-01.55.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has anyone got a spare PCB for Brooks Shera's GPS project?
Either a board, a photomask, or a complete board with components will do
(I have the DAC).
The mentioned supplier has not been able to supply a board.

I'm also looking for a 10 MHz VTO, it does not have to be the best
available.

Thanks.
Ian.

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: PCB for GPS project

From: Doug Bade <doug@ohioaprs.net>
Date: Thu, 24 May 2001 10:43:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14537-2001.05.24-10.00.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have 4 of them call me at work 10-5 edt m-f Doug Bade 800-878-6500

At 08:35 AM 5/24/2001 +0200, you wrote:
>Has anyone got a spare PCB for Brooks Shera's GPS project?
>Either a board, a photomask, or a complete board with components will do
>(I have the DAC).
>The mentioned supplier has not been able to supply a board.
>
>I'm also looking for a 10 MHz VTO, it does not have to be the best available.
>
>Thanks.
>Ian.
>
>
>
>---
>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

8. [tacgps] Re: PCB for GPS project

From: Doug Bade <doug@ohioaprs.net>
Date: Thu, 24 May 2001 10:57:21 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14542-2001.05.24-10.14.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Correction I had 2 now I have 1 board, blank board, most of the IC's
also..... Doug

At 10:43 AM 5/24/2001 -0400, you wrote:
>I have 4 of them call me at work 10-5 edt m-f Doug Bade 800-878-6500
>
>
>At 08:35 AM 5/24/2001 +0200, you wrote:
>>Has anyone got a spare PCB for Brooks Shera's GPS project?
>>Either a board, a photomask, or a complete board with components will do
>>(I have the DAC).
>>The mentioned supplier has not been able to supply a board.
>>
>>I'm also looking for a 10 MHz VTO, it does not have to be the best available.
>>
>>Thanks.
>>Ian.
>>

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9. [tacgps] Re: PCB for GPS project

From: Doug Bade <doug@ohioaprs.net>
Date: Thu, 24 May 2001 11:20:31 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14555-2001.05.24-10.37.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I just found the other 2, 3 assembled boards and 1 un-stuffed pc
board... 1 assembled board spoken for, Let me know, Doug

At 10:57 AM 5/24/2001 -0400, you wrote:
>Correction I had 2 now I have 1 board, blank board, most of the IC's
>also..... Doug
>
>
>At 10:43 AM 5/24/2001 -0400, you wrote:
>>I have 4 of them call me at work 10-5 edt m-f Doug Bade 800-878-6500
>>
>>
>>At 08:35 AM 5/24/2001 +0200, you wrote:
>>>Has anyone got a spare PCB for Brooks Shera's GPS project?
>>>Either a board, a photomask, or a complete board with components will do
>>>(I have the DAC).
>>>The mentioned supplier has not been able to supply a board.
>>>
>>>I'm also looking for a 10 MHz VTO, it does not have to be the best
>>>available.

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10. [tacgps] Re: PCB for GPS project

From: "France Antelme" <fantelme@ncal.verio.com>
Date: Thu, 24 May 2001 17:37:12 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14610-2001.05.24-19.59.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug,

I'd like to have one of the stuffed boards

-France
----- Original Message -----
From: "Doug Bade" <doug@ohioaprs.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, May 24, 2001 8:20 AM
Subject: [tacgps] Re: PCB for GPS project

> I just found the other 2, 3 assembled boards and 1 un-stuffed pc
> board... 1 assembled board spoken for, Let me know, Doug
>

>
>
> At 10:57 AM 5/24/2001 -0400, you wrote:
> >Correction I had 2 now I have 1 board, blank board, most of the IC's
> >also..... Doug
> >
> >
> >At 10:43 AM 5/24/2001 -0400, you wrote:
> >>I have 4 of them call me at work 10-5 edt m-f Doug Bade 800-878-6500
> >>
> >>
> >>At 08:35 AM 5/24/2001 +0200, you wrote:
> >>>Has anyone got a spare PCB for Brooks Shera's GPS project?
> >>>Either a board, a photomask, or a complete board with components will
do
> >>>(I have the DAC).
> >>>The mentioned supplier has not been able to supply a board.
> >>>
> >>>I'm also looking for a 10 MHz VTO, it does not have to be the best
> >>>available.
>
>
> ---
> You are currently subscribed to tacgps as: fantelme@wco.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] Anyone have info/tips on an Austron 1250B standard?

From: John Ackermann N8UR <jra@febo.com>
Date: Thu, 24 May 2001 21:26:04 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14616-2001.05.24-20.45.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I picked up an Austron 1250B frequency standard at Hamvention for a pretty
good price (I think). The unit is in excellent physical condition and it
powers up, but the meter reading in the "oven" position is different than
any other standard I've seen, and I wonder if it signifies a problem. If
anyone is familiar with the 1250* series Austron units and can tell me if
this looks normal, I'd appreciate it.

When I put the meter switch on "oven", I see a slow cycle that goes from
pinning the meter down to a reading of about 40, and then back up again,
over a period of maybe 20-30 seconds. The "reg" and "5MHz" meter readings
are stable at about mid-scale. There's no battery installed at the moment,
so I doubt that the "battery" reading means anything. The unit has been
powered up for a couple of days and still does this, so it's not a
temporary phenomenon at startup.

In most of the standards I've worked with, the oven reading starts out
pinning the scale in one direction but then stablizes to some value and
stays pretty darned constant. Should the Austron act this way, or is this
cycling normal?

Thanks for any insight...

73,
John N8UR
jra@febo.com

* As far as I can tell, the 1250B is the similar to the more common 1250A
except that it has 16 (!) 5MHz outputs but no outputs at 1MHz or 100kHz.
It's also sort of odd in that there's screwdriver access from the front
panel for "coarse" frequency setting, but no fine control and no panel
connection for voltage control. Don't know if that's the same as on the
1250A or not.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Re: PCB for GPS project

From: Ian Roberts <ITR@Nanoteq.co.za>
Date: Fri, 25 May 2001 09:01:50 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14669-2001.05.25-02.22.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug,
Please keep me a board plus components other than the DAC, let me know
what you want for these and I will send you some dollars plus postage in
an envelope, I am in South Africa.

Ian.

Doug Bade wrote:

> Correction I had 2 now I have 1 board, blank board, most of the IC's
> also..... Doug
>
>
> At 10:43 AM 5/24/2001 -0400, you wrote:
>
>> I have 4 of them call me at work 10-5 edt m-f Doug Bade 800-878-6500
>>
>>
>> At 08:35 AM 5/24/2001 +0200, you wrote:
>>
>>> Has anyone got a spare PCB for Brooks Shera's GPS project?
>>> Either a board, a photomask, or a complete board with components will
>>> do (I have the DAC).
>>> The mentioned supplier has not been able to supply a board.
>>>
>>> I'm also looking for a 10 MHz VTO, it does not have to be the best
>>> available.
>>>
>>> Thanks.
>>> Ian.
>>>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: Anyone have info/tips on an Austron 1250B standard?

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 25 May 2001 05:14:02 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14672-2001.05.25-04.32.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John --

What you describe is a strong indication that the proportional oven
control is oscillating. The period is about right for a thermal control
loop.

If this standard has any age on it (likely) and has been powered down
for a significant period (also likely) this suggests a dried out
capacitor in the regulator's loop filter.

You can best test the oscillation theory by comparing it to a known good
standard and watch to see if the frequency drifts up and down in
synchronization with the meter.

        Good luck, Bob Smith

John Ackermann N8UR wrote:
>
> I picked up an Austron 1250B frequency standard at Hamvention for a pretty
> good price (I think). The unit is in excellent physical condition and it
> powers up, but the meter reading in the "oven" position is different than
> any other standard I've seen, and I wonder if it signifies a problem. If
> anyone is familiar with the 1250* series Austron units and can tell me if
> this looks normal, I'd appreciate it.
>
> When I put the meter switch on "oven", I see a slow cycle that goes from
> pinning the meter down to a reading of about 40, and then back up again,

> over a period of maybe 20-30 seconds. The "reg" and "5MHz" meter readings
> are stable at about mid-scale. There's no battery installed at the moment,
> so I doubt that the "battery" reading means anything. The unit has been
> powered up for a couple of days and still does this, so it's not a
> temporary phenomenon at startup.
>
> In most of the standards I've worked with, the oven reading starts out
> pinning the scale in one direction but then stablizes to some value and
> stays pretty darned constant. Should the Austron act this way, or is this
> cycling normal?
>
> Thanks for any insight...
>
> 73,
> John N8UR
> jra@febo.com
>
> * As far as I can tell, the 1250B is the similar to the more common 1250A
> except that it has 16 (!) 5MHz outputs but no outputs at 1MHz or 100kHz.
> It's also sort of odd in that there's screwdriver access from the front
> panel for "coarse" frequency setting, but no fine control and no panel
> connection for voltage control. Don't know if that's the same as on the
> 1250A or not.
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex -------------
 * * Specializing in small, cost effective embedded control systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: Anyone have info/tips on an Austron 1250B standard?

From: John Ackermann <jra@febo.com>
Date: Fri, 25 May 2001 08:12:34 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14682-2001.05.25-07.31.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0a3 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

Thanks for the info, Bob. From another message, I hear that the Austron
oscillator is a sealed unit with no service info available, so I may be a
bit limited in what I can do with it, but on the other hand my investment
is low enough (and worst case I can salvage the case/power supply/5MHz
chain to mount my Efratom mini rubidium in) that there's no harm in
cracking it open to see what's going on.

Thanks!

John

--On Friday, May 25, 2001 5:14 AM -0400 Bob Smith <bobsmith5@home.com>
wrote:

> John --
>
> What you describe is a strong indication that the proportional oven
> control is oscillating. The period is about right for a thermal control
> loop.
>
> If this standard has any age on it (likely) and has been powered down
> for a significant period (also likely) this suggests a dried out
> capacitor in the regulator's loop filter.
>
> You can best test the oscillation theory by comparing it to a known good
> standard and watch to see if the frequency drifts up and down in

> synchronization with the meter.
>
>   Good luck, Bob Smith
>
>
> John Ackermann N8UR wrote:
>>
>> I picked up an Austron 1250B frequency standard at Hamvention for a
>> pretty good price (I think). The unit is in excellent physical
>> condition and it powers up, but the meter reading in the "oven" position
>> is different than any other standard I've seen, and I wonder if it
>> signifies a problem. If anyone is familiar with the 1250* series
>> Austron units and can tell me if this looks normal, I'd appreciate it.
>>
>> When I put the meter switch on "oven", I see a slow cycle that goes from
>> pinning the meter down to a reading of about 40, and then back up again,
>> over a period of maybe 20-30 seconds. The "reg" and "5MHz" meter
>> readings are stable at about mid-scale. There's no battery installed at
>> the moment, so I doubt that the "battery" reading means anything. The
>> unit has been powered up for a couple of days and still does this, so
>> it's not a temporary phenomenon at startup.
>>
>> In most of the standards I've worked with, the oven reading starts out
>> pinning the scale in one direction but then stablizes to some value and
>> stays pretty darned constant. Should the Austron act this way, or is
>> this cycling normal?
>>
>> Thanks for any insight...
>>
>> 73,
>> John N8UR
>> jra@febo.com
>>
>> * As far as I can tell, the 1250B is the similar to the more common 1250A
>> except that it has 16 (!) 5MHz outputs but no outputs at 1MHz or 100kHz.
>> It's also sort of odd in that there's screwdriver access from the front
>> panel for "coarse" frequency setting, but no fine control and no panel
>> connection for voltage control. Don't know if that's the same as on the
>> 1250A or not.
>>
>> ---
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>> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> --
>
> --------- Avoid computer viruses -- Practice safe hex -------------
> * * Specializing in small, cost effective embedded control systems * *
> Robert L. (Bob) Smith   Smith Machine Works, Inc.
> internet   bobsmith5@home.com   9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia 23236+1004
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] While we're on the subject... help IDing an HP oscillator?

From: John Ackermann N8UR <jra@febo.com>
Date: Fri, 25 May 2001 21:14:44 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14802-2001.05.25-20.33.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

While contemplating my dead Austron 1250 (see my other posts) I remembered
that I have an HP unit that I picked up a while ago that might also be able
to replace the Austron oscillator. I wonder if anyone can help me ID it.

It's a gray rectangular case with a label "00105-6034 Oscillator Assy" and

another "SERIES 1040A"
It has push-connectors (look similar to SMA) labeled "5MHz, 1V", "DIV",
"EFC +" and "EFC -". There are feedthroughs labeled "M", "+24", "+20" and
"+15". There's a legend "OUTPUTS" with a line going to the "+15"
feedthrough and the "DIV" connector. There are also two unlabeled pins on
the side of the assembly; something tells me they're for an outer oven
heater.

Any ideas? Assuming it works, would I be better off using this with
Brooks' GPS steering board than the Efratom rubidium (better short term
stability/lower noise)?

Thanks,

John N8UR
jra@febo.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: While we're on the subject... help IDing an HP oscillator?

From: HBonhorst@aol.com
Date: Sat, 26 May 2001 19:22:36 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-14924-2001.05.26-18.41.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This HP oscillator was used on old HP105 A / B units.
It was used as well on 5061A cesiums, on 5065 rubidiums,
on 5360A and 5248M counters.
If you need further assistance please contact me directly via email
Best regards, Hubert

June 2001

Original source file: tacgps.0106
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0106

1. [tacgps] goodies in Orlando?

From: "M.L. McCauley" <mtechsvc@swbell.net>
Date: Mon, 25 Jun 2001 18:02:58 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-20443-2001.06.25-18.23.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Anybody know of any good electronic surplus places in the Central FL area
OTHER than Skycraft. That's a great place, but I wonder of there are any
more?

Thanks!

Mike

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2. [tacgps] Re: goodies in Orlando?

From: "Rich Garcia" <k4gps@bellsouth.net>
Date: Wed, 27 Jun 2001 08:16:43 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-20731-2001.06.27-08.00.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am in West Palm Beach and travel up there often. We are not
aware of any others, was just talking to some other hams yesterday
about that very subject.

On 25 Jun 01, at 18:02, M.L. McCauley wrote:

Anybody know of any good electronic surplus places in the Central
FL
area OTHER than Skycraft. That's a great place, but I wonder of
there
are any more?

Thanks!

Mike

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To unsubscribe send a blank email to leave-tacgps-
5698G@lists.tapr.org

"We're from the government, and we're here to help you."

Rich Garcia K4GPS EX: N2CZF KA2FXA
k4gps@bellsouth.net
Jupiter Farms, Florida

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

July 2001

Original source file: tacgps.0107
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0107

1. [tacgps] TAPR Offices Moving; Short Closure and New Phone Numbers

From: "John R. Ackermann" <jra@febo.com>
Date: Wed, 04 Jul 2001 18:25:44 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-22236-2001.07.04-18.05.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The TAPR offices will be moving a few miles from Denton to Richardson,
Texas. We'll be closing on July 26 for the move and re-opening on August
6. The Tucson mailing address will remain the same (it is a maildrop that
forwards to the real office address) but the phone numbers will change.
Effective August 6, they will be:

Voice: 972-671-TAPR (8277)
FAX: 972-671-8716

The office email address -- tapr@tapr.org -- will not change.

The move is occurring because Dorothy Jones, KA5DWR, our longtime Office
Manager, has decided to take a well-earned retirement. It would take a lot
of words to fully describe how much Dorothy has done for TAPR, and how much
we've all relied on her over the years, so I'll just say "Thanks!"

Our new office manager is Laura Koster (XYL of Board member John Koster,
W9DDD). Laura had a baptism of fire by handling the TAPR booth at the
Dayton Hamvention this year, and she did a great job. We're very happy to
have her on board, and we're sure that she will carry on Dorothy's goal of
providing great service to our members.

73,
John Ackermann   N8UR
President, TAPR
jra@febo.com -- n8ur@tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Slightly OT: Playing with VLF Frequency Measurement

From: John Ackermann <jra@febo.com>
Date: Fri, 20 Jul 2001 09:14:06 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25365-2001.07.20-08.35.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Slightly off topic, but I thought this group might be interested...

I've rehabilitated an old Fluke 207 VLF comparator/receiver and have been
tracking my even older Sulzer 2.5 frequency standard against WWVB with it.
Rather than using a paper chart recorder, I have an analog-to-digital
converter card gathering data, which I then process and post to a web page
in near real time (well, every 20 minutes is "near real time" when you're
talking about days-long plots!).

My main time-frequency page, which at this point has links to the stuff
I've been working on and not much more, is

http://www.febo.com/time-freq/index.html

The more interesting page with the live data plots and phase statistics is

http://www.febo.com/time-freq/sulzer-wwvb.html

I've written a few very simple, very ugly, very inelegant perl filter
programs to manipulate the data, and they're at

http://www.febo.com/time-freq/tools.html

I'm sure there are much more productive things I could/should be doing with
my spare time, but it's kind of cool to be able to see how my standard is
aging from anywhere in the world via the web!

73,
John N8UR
jra@febo.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 20 Jul 2001 10:06:50 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25372-2001.07.20-09.28.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John --

Well done, sir. I know and love the Fluke 207, was employed at Fluke in
the '69-'72 time frame.

Its nice to see the time markers and the diurnal shifts, etc. so
clearly. Thanks for the contribution.

        Bob Smith

John Ackermann wrote:
>
> Slightly off topic, but I thought this group might be interested...
>
> I've rehabilitated an old Fluke 207 VLF comparator/receiver and have been
> tracking my even older Sulzer 2.5 frequency standard against WWVB with it.
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>
> The more interesting page with the live data plots and phase statistics is
>
> http://www.febo.com/time-freq/sulzer-wwvb.html
>
> I've written a few very simple, very ugly, very inelegant perl filter
> programs to manipulate the data, and they're at
>
> http://www.febo.com/time-freq/tools.html
>
> I'm sure there are much more productive things I could/should be doing with
> my spare time, but it's kind of cool to be able to see how my standard is
> aging from anywhere in the world via the web!
>
> 73,
> John N8UR
> jra@febo.com
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

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Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

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4. [tacgps] Re: tacgps digest: July 20, 2001

From: "Larry Kayser" <kayser@sympatico.ca>
Date: Sat, 21 Jul 2001 06:55:32 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25509-2001.07.21-06.22.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John:

> I've rehabilitated an old Fluke 207 VLF comparator/receiver and have been
> tracking my even older Sulzer 2.5 frequency standard

Wow, someone else with a Sulzer 2.5! My transmissions on 137.7894 kHz are
frequency referenced to a Sulzer.

I agree I would not have wanted to pay for the Sulzer in 2001 dollars, it
would really hurt my net worth hi.

Larry
VA3LK

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5. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Mon, 23 Jul 2001 00:40:13 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25733-2001.07.23-03.02.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Have a look at these two Sulzer 2.5C oscillators which are
stable in the short-term to 2E-13 and 5E-13, respectively.

    http://www.leapsecond.com/museum/sul25-1/

    http://www.leapsecond.com/museum/sul25-2/

/tvb

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6. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: John Ackermann <jra@febo.com>
Date: Mon, 23 Jul 2001 14:05:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25807-2001.07.23-13.27.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0a6 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

Those are neat looking pictures, and great data! I hope mine works as
well...

My 2.5 had a power supply and was mounted in a similar 2-holed rack panel
when I got it, but the batteries had leaked and the thing was pretty much
toast. I got a local shop to make a new panel for me, with the standard
mounted in the center and a vast bunch of BNC bulkhead connectors arrayed
on either side; it became the main patch panel for all my measurement
stuff. Mine, by the way, is a 2.5 (no letter suffix) version, so must be
quite a bit older. I have a photocopy of the original manual which shows
the specs and I think a 1962 date.

I'm probably going to be shutting my stuff down for the move this coming
weekend, and will pack the Sulzer up and send it to you then. By that
time, I will have better than a week's worth of WWVB data from the present
run (assuming nothing crashes in the meantime...)

John

--On Monday, July 23, 2001 12:40 AM -0700 Tom Van Baak <tvb@leapsecond.com>
wrote:

> Have a look at these two Sulzer 2.5C oscillators which are
> stable in the short-term to 2E-13 and 5E-13, respectively.
>
>   http://www.leapsecond.com/museum/sul25-1/
>
>   http://www.leapsecond.com/museum/sul25-2/
>
> /tvb
>
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>

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7. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: John Ackermann <jra@febo.com>
Date: Mon, 23 Jul 2001 14:14:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-25809-2001.07.23-13.35.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0a6 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

--On Monday, July 23, 2001 2:05 PM -0400 John Ackermann <jra@febo.com>
wrote:

> Those are neat looking pictures, and great data! I hope mine works as
> well...

Sorry, that wasn't meant for the list.

John

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August 2001

Original source file: tacgps.0108
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0108

1. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: John Ackermann <jra@febo.com>
Date: Mon, 23 Jul 2001 14:14:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-27571-2001.08.02-21.52.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0a6 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

--On Monday, July 23, 2001 2:05 PM -0400 John Ackermann <jra@febo.com>
wrote:

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> well...

Sorry, that wasn't meant for the list.

John

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---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: Slightly OT: Playing with VLF Frequency Measurement

From: John Ackermann <jra@febo.com>
Date: Mon, 23 Jul 2001 14:05:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-27572-2001.08.02-21.52.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0a6 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

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John

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>
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>
>   http://www.leapsecond.com/museum/sul25-2/
>
> /tvb
>
>
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>
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---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: GPS Antennas

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 10 Aug 2001 14:53:29 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29282-2001.08.10-14.16.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear Dr. Clark and subscribers --

I am conducting experiments with my M12 from Synergy and TAC32 with an
immediate goal of understanding its performance characteristics in my
environment. My longterm goal is precision timing.

It is becomming obvious that I need to improve my antenna situation,
which is pretty poor at the moment, yet I seem to be getting usable
results. I recall references to a "choke ring" antenna that you
designed and, possibly, a helix type (that was based on a drink cup???).

I am a skilled machinest and would appreciate any web references to
guide me in construction of such a beast.

        Sincerely, Bob Smith, WA4YPV

<snip>

--

--------- Avoid computer viruses -- Practice safe hex -------------
 * * Specializing in small, cost effective embedded control systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith5@home.com   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

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4. [tacgps] Homebrewed atomic standards???

From: Bob Smith <bobsmith5@home.com>
Date: Fri, 10 Aug 2001 14:55:59 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29284-2001.08.10-14.19.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello all --

Anybody ever given any serious thought to a home brewed hydrogen /
cesium / rubidium standard???

Just how insane have I become??

```
        73, de bob, wa4ypv


>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

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internet   bobsmith5@home.com           9900 Lumlay Road
landline   804/745-1065                 Richmond, Virginia 23236+1004

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```

5. [tacgps] Re: Homebrewed atomic standards???

```
From: John Franke <j.m.franke@larc.nasa.gov>
Date: Fri, 10 Aug 2001 15:34:20 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29292-2001.08.10-14.56.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Cesium and hydrogen are flowing systems and require continuous
pumping or replacement systems.  Rubidium has always appealed to me
because it is uses sealed off gas cells.  I was considering going
back a little further to an ammonia absorption cell system.  It is
not as accurate (~5 x 10-8) as a rubidium, but the gases are more
easily obtained, a gas discharge optical source is not needed, and
initially I would not be concerned with buffer gases.  The operating
frequency, 23.8701 GHz, is easily reached with affordable devices.
After all, the saturation drive level is around  1.8 milliwatts,
depending on cell size and pressure.  The absorption is about 13% per
12 feet at a cell (waveguide) pressure of 10 microns.

Anyway, that is the way  I have been thinking of going.

John  WA4WDL

>Hello all --
>
>Anybody ever given any serious thought to a home brewed hydrogen /
>cesium / rubidium standard???
>
>Just how insane have I become??
>
>       73, de bob, wa4ypv
>
>
>  >
>  > ---
>  > You are currently subscribed to tacgps as: bobsmith5@home.com
>  > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>--
>
>---------  Avoid computer viruses  --  Practice safe hex  -------------
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>Robert L. (Bob) Smith                   Smith Machine Works, Inc.
>internet   bobsmith5@home.com           9900 Lumlay Road
>landline   804/745-1065                         Richmond, Virginia 23236+1004
>
>---
>You are currently subscribed to tacgps as: J.M.FRANKE@LARC.NASA.GOV
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org


---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

6. [tacgps] RE: Homebrewed atomic standards???

From: jim_johnson@agilent.com
Date: Fri, 10 Aug 2001 14:18:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29314-2001.08.10-16.41.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Bob,

   Wow, are you ever ambitious! My first question is,
why would you want to do such a thing? You can get VERY
good, nearly cesium-like performance these days (no more SA)
by disciplining a good quartz oscillator with a GPS controller
designed by Brooks Shera. In fact, a colleague of mine and
I have done just that and we now have clocks that perform
as well (sometimes better) than the HP 58503A, which sells
for around $6,000. Our cost has been somewhere in the
neighborhood of (I'm guessing at this) $300 plus the
cost of the quartz oscillator and the GPS receiver. We
were fortunate to have oscillators and GPS receivers lying
around so we used what we had.

   As far as homebrewing atomic standards, the electronics
could certainly be built as a hobby project (not for the
faint of heart, however) but a cesium beam tube? Not a
chance. For rubidium you need glassware (glass cell with
Rb in it and a glass lamp with Rb) and a microwave cavity.
Both the cesium beam tube and the lamp in the Rb have
finite lifetimes, as opposed to quartz which should last
forever.

   Putting it into perspective, you might have better
luck homebrewing a jet aircraft than you would a cesium
beam frequency standard - but I'm impressed with your level
of ambition. Good luck!

Jim Johnson
Precision Instrumentation
Agilent Laboratories
Palo Alto, CA

> -----Original Message-----
> From: Bob Smith [mailto:bobsmith5@home.com]
> Sent: Friday, August 10, 2001 11:56 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Homebrewed atomic standards???
>
>
> Hello all --
>
> Anybody ever given any serious thought to a home brewed hydrogen /
> cesium / rubidium standard???
>
> Just how insane have I become??
>
>   73, de bob, wa4ypv

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7. [tacgps] Re: GPS Antennas

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 10 Aug 2001 21:03:20 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29370-2001.08.10-23.25.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Try this page has several links:

http://www.unavco.ucar.edu/dev_test/antennas/pcv.html

73,
Dan - W6LSN

Bob Smith wrote:
>
> Dear Dr. Clark and subscribers --
>

> I am conducting experiments with my M12 from Synergy and TAC32 with an
> immediate goal of understanding its performance characteristics in my
> environment. My longterm goal is precision timing.
>
> It is becomming obvious that I need to improve my antenna situation,
> which is pretty poor at the moment, yet I seem to be getting usable
> results. I recall references to a "choke ring" antenna that you
> designed and, possibly, a helix type (that was based on a drink cup???).
>
> I am a skilled machinest and would appreciate any web references to
> guide me in construction of such a beast.
>
>   Sincerely, Bob Smith, WA4YPV
>
> <snip>
>
> --
>
> --------- Avoid computer viruses -- Practice safe hex -------------
> * * Specializing in small, cost effective embedded control systems * *
> Robert L. (Bob) Smith   Smith Machine Works, Inc.
> internet   bobsmith5@home.com   9900 Lumlay Road
> landline   804/745-1065   Richmond, Virginia 23236+1004
>
> ---
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---
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8. [tacgps] Re: GPS Antennas

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 11 Aug 2001 10:42:18 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29415-2001.08.11-10.04.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Many thanks to Dan for these useful links!!

They have produced much useful information on the machining problem. As
always, a project such as this leads to additional questions:

1. The classic choke ring seems to run about 16" in diameter. My
intent was to hog one out of a billet of aluminum or brass but, this is
simply too big to swing on my fine little 9" Southbend toolroom lathe.
Does anyone have a feel for the impact of reducing the design to 8"-9"
overall. Certainly there would be some loss in multipath rejection, but
I am not on a millimeter geodesic survey, I just want a good antenna for
recision timing use in my ham shack.

2. The key, driving element of the choke ring seems to be the "Dorne &
Margolin C146-10 dipole antenna element". This seems to be a 10 element
dipole array of some type. Anybody know of any information resources
for this? A net search turned up nothing but advertisement blurbs for
choke ring antennas that used the D & M element. Are there simpler
ways to couple the choke ring ground plane to the feed line? Perhaps a
simple vertical probe or a two element dipole?

        Many thanks es 73, de Bob WA4YPV / TAPR supporter

Dan Hinz wrote:
>
> Try this page has several links:
>
> http://www.unavco.ucar.edu/dev_test/antennas/pcv.html
>
> 73,
> Dan - W6LSN

--

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9. [tacgps] Re: GPS Antennas

From: "Brooks Shera" <ebs@lanl.gov>
Date: Sat, 11 Aug 2001 09:25:58 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29425-2001.08.11-10.48.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi
I suggest that if your interest is in timing you don't need to bother
putting a choke ring under your gps antenna. The timing accuracy of a
receiver is not very much affected by its exact location. For example, in
position-hold mode the position can be incorrect by several meters with no
appreciable effect on the timing accuracy. Even for surveying, the choke
ring is only important at the mm accuracy level in my experience. Accuracy
at the cm level is readily obtained using simple, bare mag-mount patch
antennas such as the Motorola Ant-97 (see www.rt66.com/~shera for some
surveying results with simple equipment).

Perhaps the best thing you can do is put your antenna in a location with a
good view of the sky.

Brooks

>From: "Bob Smith" <bobsmith5@home.com
> Many thanks to Dan for these useful links!!
>
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> always, a project such as this leads to additional questions:
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> Margolin C146-10 dipole antenna element". This seems to be a 10 element
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> Robert L. (Bob) Smith Smith Machine Works, Inc.
> internet   bobsmith5@home.com 9900 Lumlay Road
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>
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10. [tacgps] RE: Homebrewed atomic standards???

From: Bob Smith <bobsmith5@home.com>
Date: Sat, 11 Aug 2001 11:44:15 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29426-2001.08.11-11.06.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jim --

Thanks for the reality check. In fact, I have a fair oscillator that I
am currently hand tracking to GPS using a home brew counter timer chain
that will generate 1 PPS pulses at thumbwheel settable 1 mS intervals
and the 1 PPS from my M12 GPS as a scope trigger. The oscillator is 40+
years old and is getting a little (very) tired. Thus I lust after a
really stable oscillator. I'll reconsider the TOC solution. I've got
the QST artical around here somewhere.

So thanks, and back to my real homebrew!

        73, de bob

jim_johnson@agilent.com wrote:
>
> Hi Bob,
>
>   Wow, are you ever ambitious! My first question is,
> why would you want to do such a thing? You can get VERY
> good, nearly cesium-like performance these days (no more SA)
> by disciplining a good quartz oscillator with a GPS controller
> designed by Brooks Shera. In fact, a colleague of mine and
> I have done just that and we now have clocks that perform
> as well (sometimes better) than the HP 58503A, which sells
> for around $6,000. Our cost has been somewhere in the
> neighborhood of (I'm guessing at this) $300 plus the
> cost of the quartz oscillator and the GPS receiver. We
> were fortunate to have oscillators and GPS receivers lying
> around so we used what we had.
>
>   As far as homebrewing atomic standards, the electronics
> could certainly be built as a hobby project (not for the
> faint of heart, however) but a cesium beam tube? Not a
> chance. For rubidium you need glassware (glass cell with
> Rb in it and a glass lamp with Rb) and a microwave cavity.
> Both the cesium beam tube and the lamp in the Rb have
> finite lifetimes, as opposed to quartz which should last
> forever.
>
>   Putting it into perspective, you might have better
> luck homebrewing a jet aircraft than you would a cesium
> beam frequency standard - but I'm impressed with your level
> of ambition. Good luck!
>
> Jim Johnson
> Precision Instrumentation
> Agilent Laboratories
> Palo Alto, CA
>
> > -----Original Message-----
> > From: Bob Smith [mailto:bobsmith5@home.com]
> > Sent: Friday, August 10, 2001 11:56 AM
> > To: TAPR Special Interest Group
> > Subject: [tacgps] Homebrewed atomic standards???
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> >
> > Hello all --
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> > Anybody ever given any serious thought to a home brewed hydrogen /
> > cesium / rubidium standard???
> >
> > Just how insane have I become??
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> >   73, de bob, wa4ypv
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@home.com
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11. [tacgps] Re: GPS Antennas

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 11 Aug 2001 18:16:14 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29458-2001.08.11-18.37.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Maybe Lyris won't choke because this is too long...

Overall, I agree strongly with Brooks. (Of course, having spent a lot
of time doing some similar work on surveying accuracy may have something
to do with it...). To expand further, however, on timing antennas, it's
much more important to ask your receiver to look high in the sky
(minimize tropo/iono impact, and to reduce, where possible, multipath
interference. I am truly fascinated by the Novatel spiral chokering
design, and by the Javad "dual-depth" chokering, which utilizes tuned
cavities to sink errant signal to ground.

The choke ring is designed to mitigate multipath and ground reflected
radiation. It acts, effectively by increasing the Q of the antenna.
I've argued, conversely, that what it does is introduce a knife-edge
diffraction component in the near-field. I suspect the truth lies in a
synthesis of the two, more'n likely with more weight going to antenna Q.

Personal experience, however, suggests that the right answer is to place
the antenna in an area where multipath is minimized rather than
depending on a chokering to fix your problems.

When worrying about survey accuracies, the important aspects of
reproducibility mandate use of an antenna with either well determined
phase center characteristics, or that you adequately ascertain these
characteristics empirically. I believe a little more strongly than
Brooks that either a chokering mount or a large groundplane is
beneficial here... or an antenna nestled in charcoal, perhaps. In
general, I prefer patch antennas to either discrete element or helical
antennas for survey GPS work, based on my experience. Some day, when I
can get funding for it, I'll set up a proper antenna test range for GPS
antenna work, and verify this.

73, gerry
--
Brooks Shera wrote:
>
> Hi
> I suggest that if your interest is in timing you don't need to bother
> putting a choke ring under your gps antenna. The timing accuracy of a
> receiver is not very much affected by its exact location. For example, in
> position-hold mode the position can be incorrect by several meters with no
> appreciable effect on the timing accuracy. Even for surveying, the choke
> ring is only important at the mm accuracy level in my experience. Accuracy
> at the cm level is readily obtained using simple, bare mag-mount patch
> antennas such as the Motorola Ant-97 (see www.rt66.com/~shera for some
> surveying results with simple equipment).
>
> Perhaps the best thing you can do is put your antenna in a location with a
> good view of the sky.
>
> >From: "Bob Smith" <bobsmith5@home.com
> > Many thanks to Dan for these useful links!!
> >
> > They have produced much useful information on the machining problem. As
> > always, a project such as this leads to additional questions:
> >
> > 1. The classic choke ring seems to run about 16" in diameter. My
> > intent was to hog one out of a billet of aluminum or brass but, this is
> > simply too big to swing on my fine little 9" Southbend toolroom lathe.
> > Does anyone have a feel for the impact of reducing the design to 8"-9"

> > overall. Certainly there would be some loss in multipath rejection, but
> > I am not on a millimeter geodesic survey, I just want a good antenna for
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> >
> > 2. The key, driving element of the choke ring seems to be the "Dorne &
> > Margolin C146-10 dipole antenna element". This seems to be a 10 element
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> > Dan Hinz wrote:
> > >
> > > Try this page has several links:
> > >
> > > http://www.unavco.ucar.edu/dev_test/antennas/pcv.html
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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12. [tacgps] RE: Homebrewed atomic standards???

From: Dan Hinz <dan.hinz@ieee.org>
Date: Sun, 12 Aug 2001 08:45:08 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29534-2001.08.12-11.07.43--lyris.tacgps#tapr.org@lists.tapr.org>
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Bob

You mentioned that your oscillator was tired. If you need a source for
them, you can try either of
the links below. I purchased mine from the first one shortly after
Brooks' article first appeared.
I checked today and the "test equipment" link is dead, might want to
send an e-mail to
Gary- N6ZD the owner. He was very helpful with several questions that I
had.

The second link is also mentioned in Brooks' article. Might consider
e-bay too.

http://tech-services.com/consult.htm

http://www.lehmanscientific.com/

Good Luck & 73
Dan - W6LSN

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13. [tacgps] Re: GPS Antennas

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Sun, 12 Aug 2001 09:40:47 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29537-2001.08.12-12.01.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob,

I am not a GPS antenna expert, but I have experimented with a half-dozen or so
antennas on an Ashtech centimeter-grade (carrier phase) GPS receiver and a
Motorola Oncore VP timing receiver. When you are trying to establish the L1
carrier phase, any multipath signals can be extremely disruptive, and that is
why choke-ring and other "low multipath" antennas were developed. However,
the fancy machine work on the fins is only part of the high cost of such
antennas. In order to establish a GPS position at the centimeter level (not
to mention the millimeter level), the antenna must have a phase center that is
exactly on the physical axis. This coincidence must be uniform at all points
of the compass, from just above the horizon to the zenith. This is a tall
order, and it involves not just precision design and manufacturing, but also

some intensive calibration and alignment.

One experiment I performed to verify this statement was to center a fairly inexpensive patch antenna on a level ground plane disk, with a clear view of the sky in all directions. I used my Ashtech receiver to record RINEX data in a number of two-hour sessions, rotating the disk on its axis a known angle between sessions. After post-processing the data, I noted a "slop" of nearly a meter in the position solution. I then repeated the test, using my Ashtech low-multipath antenna on the same mount, and found the position error to be less than 3 cm.

Now, I know that this experiment will not stand up under scientific scrutiny, simply because a robust test requires several days, at various times of the day, and much longer occupations. Nevertheless, I know that precision positioning requires precision antennas. I am convinced that precision timing, which is sensitive to carrier phase, will also benefit from antennas which have a uniform phase response and freedom from multipath reception. A choke-ring antenna may be extreme overkill. I'd opt for a GPS antenna designed for timing reception.

73, Eric Lemmon WB6FLY

> >Bob Smith wrote: I am conducting experiments with my M12 from Synergy and
> TAC32 with an immediate goal of understanding its performance
> characteristics in my environment. My longterm goal is precision timing.
> It is becomming obvious that I need to improve my antenna situation, which
> is pretty poor at the moment>>>

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14. [tacgps] Re: GPS Antennas

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 12 Aug 2001 13:07:54 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29544-2001.08.12-13.29.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In fact, the experiments you performed, if well documented, would stand up under scrutiny. One thing I'd suggest... and National Geodetic Survey confirms: 4-hour occupations for geodetic work are necessary. I've published on this, and will try to get that manuscript up on http://page4.cs.tamu.edu/page4/ maybe next week ("How Long Must We Wait?").

I find an error of slop a bit larger than I'd have expecte or what I've seen in some of MY ad hoc experiments, but not inexplicable.

And, your point that the phase center of the L1 element for the chokering-augmented antenna must be zero'd is completely accurate. The L2 phase center must be well documented, as well.

gerry
--
"Eric G. Lemmon" wrote:
>
> Bob,
>
> I am not a GPS antenna expert, but I have experimented with a half-dozen or so
> antennas on an Ashtech centimeter-grade (carrier phase) GPS receiver and a
> Motorola Oncore VP timing receiver. When you are trying to establish the L1
> carrier phase, any multipath signals can be extremely disruptive, and that is
> why choke-ring and other "low multipath" antennas were developed. However,
> the fancy machine work on the fins is only part of the high cost of such
> antennas. In order to establish a GPS position at the centimeter level (not
> to mention the millimeter level), the antenna must have a phase center that is
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> inexpensive patch antenna on a level ground plane disk, with a clear view of
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> less than 3 cm.
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> Now, I know that this experiment will not stand up under scientific scrutiny,
> simply because a robust test requires several days, at various times of the
> day, and much longer occupations. Nevertheless, I know that precision
> positioning requires precision antennas. I am convinced that precision
> timing, which is sensitive to carrier phase, will also benefit from antennas
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Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
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15. [tacgps] Re: GPS Antennas

From: "Brooks Shera" <ebs@lanl.gov>
Date: Sun, 12 Aug 2001 13:29:19 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-29549-2001.08.12-14.51.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I agree with Gerry, position differences of a meter are rather large to be
caused by carrier phase multipath. Only I would say, WAY too large. The
most serious effect of multipath reflections is to shift the true phase by
90 degrees (a quarter of a cycle, which is 5 cm for a wavelength of 20 cm).
This topic is discussed at some length in the excellent book "GPS: Theory
and Practice" by Hoffmann-Wellenhof, et al.

The size of the differences you report suggest to me that your position
measurements might be based on code rather than carrier data, since the
larger effective wavelength of the code phase makes multipath a much larger
effect. In fact, I have used this difference (over a short baseline) to
estimate the multipath rejection of an antenna arrangement, comparing a
patch antenna sitting on a ground plane with the same antenna sitting on a
choke ring (the pie pan variety described here a year or two ago). I could
see no significant difference with the choke ring. I must say the site was
decent with a clear view of the sky, but multipath on the code phase was
quite evident with both antenna settings.

Counselman in a 1981 paper stated (quoted in the above book) : "The
multipath effects on carrier phases for relative positioning with short
baselines should generally not be more than 1 cm." My observations are
consistent with this.

All this is somewhat off the topic of this group but I think it is
interesting none the less.

Brooks

>From: "Gerry Creager N5JXS" <gerry@cs.tamu.edu>

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> up under scrutiny. One thing I'd suggest... and National Geodetic
> Survey confirms: 4-hour occupations for geodetic work are necessary.
> I've published on this, and will try to get that manuscript up on
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reception. A
> > choke-ring antenna may be extreme overkill. I'd opt for a GPS antenna
> > designed for timing reception.
>
> --
> Gerry Creager -- gerry@cs.tamu.edu

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16. [tacgps] RE: Homebrewed atomic standards???

From: jim_johnson@agilent.com
Date: Thu, 16 Aug 2001 09:33:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-30310-2001.08.16-11.56.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Bob,

   Have been in class all week so am just now getting
to emails. I'm glad to hear you might reconsider your
atomic standards project. Time is probably better spent
sitting by the pool with a refreshing beverage! Good
luck - you sound like an active experimenter.

73,
Jim W6SC

> -----Original Message-----
> From: Bob Smith [mailto:bobsmith5@home.com]
> Sent: Saturday, August 11, 2001 8:44 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Homebrewed atomic standards???
>
>
> Jim --
>
> Thanks for the reality check. In fact, I have a fair
> oscillator that I
> am currently hand tracking to GPS using a home brew counter
> timer chain
> that will generate 1 PPS pulses at thumbwheel settable 1 mS intervals
> and the 1 PPS from my M12 GPS as a scope trigger. The
> oscillator is 40+
> years old and is getting a little (very) tired. Thus I lust after a
> *really* stable oscillator. I'll reconsider the TOC
> solution. I've got
> the QST artical around here somewhere.
>
> So thanks, and back to my real homebrew!
>
>   73, de bob
>
>
> jim_johnson@agilent.com wrote:
> >
> > Hi Bob,
> >
> >   Wow, are you ever ambitious! My first question is,
> > why would you want to do such a thing? You can get VERY
> > good, nearly cesium-like performance these days (no more SA)
> > by disciplining a good quartz oscillator with a GPS controller
> > designed by Brooks Shera. In fact, a colleague of mine and
> > I have done just that and we now have clocks that perform
> > as well (sometimes better) than the HP 58503A, which sells
> > for around $6,000. Our cost has been somewhere in the
> > neighborhood of (I'm guessing at this) $300 plus the
> > cost of the quartz oscillator and the GPS receiver. We
> > were fortunate to have oscillators and GPS receivers lying
> > around so we used what we had.
> >
> >   As far as homebrewing atomic standards, the electronics
> > could certainly be built as a hobby project (not for the
> > faint of heart, however) but a cesium beam tube? Not a
> > chance. For rubidium you need glassware (glass cell with
> > Rb in it and a glass lamp with Rb) and a microwave cavity.
> > Both the cesium beam tube and the lamp in the Rb have
> > finite lifetimes, as opposed to quartz which should last
> > forever.
> >
> >   Putting it into perspective, you might have better
> > luck homebrewing a jet aircraft than you would a cesium
> > beam frequency standard - but I'm impressed with your level
> > of ambition. Good luck!
> >
> > Jim Johnson
> > Precision Instrumentation
> > Agilent Laboratories
> > Palo Alto, CA
> >

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17. [tacgps] 2001 ARRL/TAPR DCC September 21-23, 2001

From: "Steven Bible" <n7hpr@tapr.org>
Date: Mon, 27 Aug 2001 23:06:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-32734-2001.08.28-01.26.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

2001 ARRL/TAPR Digital Communications Conference
Cincinnati, Ohio
September 21-23, 2001

- -
Hurry! Conference Room Rates end September 1st!
- -

DCC Schedule Highlights:

Friday
All Day APRS Seminar

Saturday
Technical Papers and Introductory Sessions
Banquet Speaker and Prize Drawing

Sunday - 5 Hour Seminar:
"Simulating Circuits and Systems with Serenade SV"
by Dave Newkirk, W9VES

- -

The 20th ARRL and TAPR Digital Communications Conference will be held September 21-23 in Cincinnati, Ohio. The annual gathering provides an international forum for radio amateurs involved in digital communication, networking, and related technologies to meet, publish their work, and present new ideas and techniques for discussion.

The DCC is for technically oriented amateurs of all experience levels to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications.

Sessions at the beginner, intermediate, and advanced levels will be offered in selected areas of digital communication. Topics include APRS, satellite communication, TCP/IP, digital radio, spread spectrum and other introductory topics. Two symposia/seminars will be held which allow those with additional time and interest to make the most of the conference. For those who may have interest in just one symposium or seminar, registration for the conference is not required to attend these activities.

The DCC banquet is Saturday night. A guest speaker will speak after the banquet and a prize drawing will top the evening. The Sunday morning seminar topic has not yet been announced.

This year's fifth annual Automated Position Reporting System (APRS) National Symposium will be an all-day Friday event moderated by Steve Dimse, K4HG--the developer of javAPRS and www.findu.com. Possible attendees include APRS software authors such as Bob Bruninga, WB4APR--the father of APRS--Keith Sproul, WU2Z, and Mark Sproul, KB2ICI--the developers of MacAPRS and WinAPRS--Brent Hildebrand, KH2Z--the developer of APRSPLUS, Mike Musick, N0QBF--developer of PocketAPRS--and other nationally known APRS leaders. This session will include in-depth discussions and presentations on the status and future of APRS. It's a unique opportunity to gain insight into this fast-paced aspect of digital operation that combines computers, packet radio and GPS.

Local co-hosts for the 2001 ARRL and TAPR DCC are
Greater Cinti Amateur Radio Assn. http://w3.one.net/~rkuns/gcara.html
DIAL Radio Club http://www.qsl.net/w8blv/Miami
Valley FM Association http://www.mvfma.org/Southwest
Ohio Digital Symposium http://w3.one.net/~rkuns/swohdigi.html

Conference presentations, meetings, and seminars will be held at the Holiday Inn Cincinnati--Airport and Conference Center <http://www.basshotels.com/hotels/cvgap>; 859-371-2233. A special DCC room rate of $89/single and $89/double per night has been blocked for 50 rooms and is available until September 1. Once the 50 rooms have been reserved, room rates will increase. The hotel provides transportation to and from the Cincinnati/Northern Kentucky International Airport.

Full information, a registration form, and hotel information also may be obtained by contacting Tucson Amateur Packet Radio, 972-671-TAPR (8277); fax 972-671-8716; e-mail: tapr@tapr.org.

Conference registration includes the conference Proceedings, sessions, meetings, and lunch on Saturday. Registrations received before September 1 are $45. After September 1 or at the door, registration is $55. The banquet is $30. The APRS National Symposium on Friday is $25. The Sunday seminar is $20.

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18. [tacgps] 5/10 MHz => 1PPS PCBs. Interest?

From: "Dr. Tom Clark" <tac@clark.net>
Date: Wed, 29 Aug 2001 01:21:22 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33015-2001.08.29-00.44.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Some of you may recall that a couple of years ago I posted the schematic
for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.
In conjunction with a project I'm doing, I had the need to dust off that
design and make it into a PCB. In the next couple of weeks I'm going to send
the board off to the PCB house to have a number of copies made and I'd like
to know if any of you would like copies. You can see the essence of the
schematic (the U1-U4 string) at URL
     ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.

Except for a couple of MiniCircuit parts, all the parts are straight out of
the DigiKey catalog
and the PCB is designed to drop into a cheap case available from DigiKey if
you want it to look nice.

Here are some of the salient features:

Frequency Standard Input: 5 or 10 MHz, jumper selected. Your standard feeds
  a directional coupler and amplifier (the MiniCircuits parts) so that the
  counter is isolated from the signal source. Normally the 5/10 MHz in/out
  is via PCB mounted BNCs, but the board has a large 0.1" grid kludge area,
  so you can mount a VCXO or TCXO "can" on the PCB. The kludge area could
  house a single IC doubler to give 10 MHz from a 5 MHz reference osc.

Signal Outputs:
 - The "raw" frequency standard signal is looped thru via a 10 dB SMT
   directional coupler
 - 1 PPS, 1 kHz and a digital replica of the input, all driven by isolated
   Lo-Z 0/+5V digital drivers (using a circuit similar to the output drivers
   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
   connectors. The 1 PPS output has a 20%/80% duty cycle like the ONCORE.
   The 1 kHz output is a 40/60% (nearly) square-wave.

Divider Synchronization: A CMOS level GPS 1PPS signal (like from a TAC-2)
  can be input to a PCB mounted BNC so that the divider chain can be synched
  to GPS time.

Temp Monitor: For my application I needed temperature logging capability,
  so the PCB includes an RJ11 connector and room for two Dallas One-Wire
  DS1820 (TO92 case) temperature monitors (ignore if you don't need them).

Power: +12V is regulated down to +5V with onboard 7805.

Since the parts are easy to get from DigiKey, I'll probably just supply a
couple of the harder to get parts (like the MiniCircuits widgets that have
qty=25 ordering restrictions). But if the demand is there, I might consider
doing a full parts kit.

So please let me know if there is any interest (and your preferences on bare
PCB vs kit).

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Wed, 29 Aug 2001 00:48:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33019-2001.08.29-01.14.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm interested, let us know what the boards will cost. I just sent my
rubidium out for calibration and found that one of my backup batteries
leaked and it got my old divider board and part of the chassis. So I am

starting over. This time the battery backup will be in a different
chassis...

> ----------
> From: Dr. Tom Clark[SMTP:tac@clark.net]
> Reply To: TAPR Special Interest Group
> Sent: Wednesday, August 29, 2001 12:21 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] 5/10 MHz => 1PPS PCBs. Interest?
>
> Some of you may recall that a couple of years ago I posted the schematic
> for a divider chain to bring your 5/10 MHz frequency standard down to
> 1PPS.
> In conjunction with a project I'm doing, I had the need to dust off that
> design and make it into a PCB. In the next couple of weeks I'm going to
> send
> the board off to the PCB house to have a number of copies made and I'd
> like
> to know if any of you would like copies. You can see the essence of the
> schematic (the U1-U4 string) at URL
>   ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.
>
> Except for a couple of MiniCircuit parts, all the parts are straight out
> of
> the DigiKey catalog
> and the PCB is designed to drop into a cheap case available from DigiKey
> if
> you want it to look nice.
>
> Here are some of the salient features:
>
> Frequency Standard Input: 5 or 10 MHz, jumper selected. Your standard
> feeds
>   a directional coupler and amplifier (the MiniCircuits parts) so that
> the
>   counter is isolated from the signal source. Normally the 5/10 MHz in/out
>   is via PCB mounted BNCs, but the board has a large 0.1" grid kludge
> area,
>   so you can mount a VCXO or TCXO "can" on the PCB. The kludge area could
>   house a single IC doubler to give 10 MHz from a 5 MHz reference osc.
>
> Signal Outputs:
> - The "raw" frequency standard signal is looped thru via a 10 dB SMT
>   directional coupler
> - 1 PPS, 1 kHz and a digital replica of the input, all driven by isolated
>   Lo-Z 0/+5V digital drivers (using a circuit similar to the output
> drivers
>   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
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>   The 1 kHz output is a 40/60% (nearly) square-wave.
>
> Divider Synchronization: A CMOS level GPS 1PPS signal (like from a TAC-2)
>   can be input to a PCB mounted BNC so that the divider chain can be
> synched
>   to GPS time.
>
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>   so the PCB includes an RJ11 connector and room for two Dallas One-Wire
>   DS1820 (TO92 case) temperature monitors (ignore if you don't need them).
>
> Power: +12V is regulated down to +5V with onboard 7805.
>
> Since the parts are easy to get from DigiKey, I'll probably just supply a
> couple of the harder to get parts (like the MiniCircuits widgets that have
> qty=25 ordering restrictions). But if the demand is there, I might
> consider
> doing a full parts kit.
>
> So please let me know if there is any interest (and your preferences on
> bare
> PCB vs kit).
>
> 73, Tom
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

20. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: Glenn Little <glittle@awod.com>
Date: Wed, 29 Aug 2001 06:32:47 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33030-2001.08.29-05.57.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom

I would be interested in one of the boards. About the DS1820. This is a now obsolete part. The part is next to imposible to find. We use it at work. The replacement is a DS18S20. If you are using the chip in parisite power mode, you have to short two of the pins together. This drove us crazy trying to find out why the DS18S20 would not work in place of the DS1820.

I can get the details on Tuesday. I will be leaving town today and away from email.

73

Glenn
WB4UIV

At 01:21 AM 8/29/01 -0400, you wrote:
>Some of you may recall that a couple of years ago I posted the schematic
>for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.
>In conjunction with a project I'm doing, I had the need to dust off that
>design and make it into a PCB. In the next couple of weeks I'm going to send
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>
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>   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
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>couple of the harder to get parts (like the MiniCircuits widgets that have
>qty=25 ordering restrictions). But if the demand is there, I might consider
>doing a full parts kit.
>
>So please let me know if there is any interest (and your preferences on bare
>PCB vs kit).
>
>73, Tom
>
>
>---
>You are currently subscribed to tacgps as: GLITTLE@AWOD.COM

>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
Glenn Little   glittle@awod.com   QCWA LM 28417
Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR

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21. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Wed, 29 Aug 2001 08:44:40 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33040-2001.08.29-08.08.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HI, Tom!

Thanks for the note to the list. I'd be interested in whatever you decide
to put together...board, partial parts, or full parts list. Full parts list
would be ideal, but I'll take what I can get.

Thanks again!

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.qsl.net/w3sz

> -----Original Message-----
> From: bounce-tacgps-23685@lists.tapr.org
> [mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of Dr. Tom Clark
> Sent: Wednesday, August 29, 2001 1:21 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] 5/10 MHz => 1PPS PCBs. Interest?
>
>
> Some of you may recall that a couple of years ago I posted
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> for a divider chain to bring your 5/10 MHz frequency standard
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> Except for a couple of MiniCircuit parts, all the parts are
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>
> So please let me know if there is any interest (and your
> preferences on bare
> PCB vs kit).
>
> 73, Tom

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22. [tacgps] 5/10 MHz => 1PPS PCBs. Interest?

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Wed, 29 Aug 2001 09:39:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33046-2001.08.29-09.02.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom -- Put me down for 3 of the boards. Let me know cost and other
details. Thanks.
John W4SF
mailto:jprongle@tampabay.rr.com

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23. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: Alberto di Bene <dibene@usa.net>
Date: Wed, 29 Aug 2001 16:19:04 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33063-2001.08.29-09.43.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,
talking of PCBs, does anybody know if/where it exists a PCB
for the Analog Device AD9854 DDS ?

I obtained this chip as a sample from AD, but it has so many pins,
and so close each other that I feel I won't be able to produce myself
a PCB with the usual techniques used for ham projects.

Ideally it should only bring each pin to a larger connection pad, which
then I could use to access the chip.

TNX for any info

73 Alberto I2PHD

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24. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: "Chuck Pinkham" <pinkham@erols.com>
Date: Wed, 29 Aug 2001 11:02:57 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33068-2001.08.29-10.27.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,

I am interested in two boards. Kits are always nice, but just the
boards and MIniCircuits stuff is ok.

Thanks,
Chuck

----- Original Message -----
From: "Dr. Tom Clark" <tac@clark.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Wednesday, August 29, 2001 1:21 AM
Subject: [tacgps] 5/10 MHz => 1PPS PCBs. Interest?

| Some of you may recall that a couple of years ago I posted the
schematic
| for a divider chain to bring your 5/10 MHz frequency standard down to
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| Except for a couple of MiniCircuit parts, all the parts are straight
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| Signal Outputs:
| - The "raw" frequency standard signal is looped thru via a 10 dB SMT
| directional coupler
| - 1 PPS, 1 kHz and a digital replica of the input, all driven by
isolated
| Lo-Z 0/+5V digital drivers (using a circuit similar to the output
drivers

```
|    I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
|    connectors. The 1 PPS output has a 20%/80% duty cycle like the
ONCORE.
|    The 1 kHz output is a 40/60% (nearly) square-wave.
|
| Divider Synchronization: A CMOS level GPS 1PPS signal (like from a
TAC-2)
|   can be input to a PCB mounted BNC so that the divider chain can be
synched
|   to GPS time.
|
| Temp Monitor: For my application I needed temperature logging
capability,
|   so the PCB includes an RJ11 connector and room for two Dallas
One-Wire
|   DS1820 (TO92 case) temperature monitors (ignore if you don't need
them).
|
| Power: +12V is regulated down to +5V with onboard 7805.
|
| Since the parts are easy to get from DigiKey, I'll probably just
supply a
| couple of the harder to get parts (like the MiniCircuits widgets that
have
| qty=25 ordering restrictions). But if the demand is there, I might
consider
| doing a full parts kit.
|
| So please let me know if there is any interest (and your preferences
on bare
| PCB vs kit).
|
| 73, Tom
|
|
| ---
| You are currently subscribed to tacgps as: k3per@arrl.net
| To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
|


---
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```

25. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

```
From: John Koster <w9ddd@tapr.org>
Date: Wed, 29 Aug 2001 11:29:02 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33092-2001.08.29-11.52.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

I don't know what kind of package the Analog Device AD9854 comes in, but
as for concept, look at this:

http://www.jdr.com/interact/item.asp?itemno=gr-cgn-1001

I don't recall where, but I think I have seen them for SMT parts as well
as for a broader range of PLCC parts than this link shows.

Besides lurking the JDR site, you might try Jameco or Digikey. Or perhaps
a general web search for prototyping + your package type. There's a lot
of stuff out there from small unknown organizations.

Good luck.

John Koster, W9DDD
<w9ddd@tapr.org>

On Wed, 29 Aug 2001, Alberto di Bene wrote:

```
> Hi all,
>   talking of PCBs, does anybody know if/where it exists a PCB
> for the Analog Device AD9854 DDS ?
>
> I obtained this chip as a sample from AD, but it has so many pins,
> and so close each other that I feel I won't be able to produce myself
> a PCB with the usual techniques used for ham projects.
```

> Ideally it should only bring each pin to a larger connection pad, which
> then I could use to access the chip.
>
> TNX for any info
>
> 73 Alberto I2PHD
>
>
>
> ---
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>
>

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26. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: John Koster <w9ddd@tapr.org>
Date: Wed, 29 Aug 2001 13:31:36 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33114-2001.08.29-13.55.08--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

You might also find the following of interest.

http://members.iinet.net.au/~richardh/Direct%20Digital%20Synthesizer%20using%20the%20AD9854%20quadrature%20DDS.htm

John Koster, W9DDD
<w9ddd@tapr.org>

On Wed, 29 Aug 2001, Alberto di Bene wrote:

> Hi all,
>   talking of PCBs, does anybody know if/where it exists a PCB
> for the Analog Device AD9854 DDS ?
>
> I obtained this chip as a sample from AD, but it has so many pins,
> and so close each other that I feel I won't be able to produce myself
> a PCB with the usual techniques used for ham projects.
>
> Ideally it should only bring each pin to a larger connection pad, which
> then I could use to access the chip.
>
> TNX for any info
>
> 73 Alberto I2PHD
>
>
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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27. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: "paulnocella@sprintmail.com" <paulnocella@sprintmail.com>
Date: Wed, 29 Aug 2001 15:26:26 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33118-2001.08.29-14.49.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

Yes, I could use two kits (or at least just the boards if that is all that is available)
Many thanks for allowing us this opportunity !
Paul, WB2SKC

Original Message:

From: Dr. Tom Clark tac@clark.net
Date: Wed, 29 Aug 2001 01:21:22 -0400
To: tacgps@lists.tapr.org
Subject: [tacgps] 5/10 MHz => 1PPS PCBs. Interest?

Some of you may recall that a couple of years ago I posted the schematic
for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.
In conjunction with a project I'm doing, I had the need to dust off that
design and make it into a PCB. In the next couple of weeks I'm going to send
the board off to the PCB house to have a number of copies made and I'd like
to know if any of you would like copies. You can see the essence of the
schematic (the U1-U4 string) at URL
     ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.

Except for a couple of MiniCircuit parts, all the parts are straight out of
the DigiKey catalog
and the PCB is designed to drop into a cheap case available from DigiKey if
you want it to look nice.

Here are some of the salient features:

Frequency Standard Input: 5 or 10 MHz, jumper selected. Your standard feeds
  a directional coupler and amplifier (the MiniCircuits parts) so that the
  counter is isolated from the signal source. Normally the 5/10 MHz in/out
  is via PCB mounted BNCs, but the board has a large 0.1" grid kludge area,
  so you can mount a VCXO or TCXO "can" on the PCB. The kludge area could
  house a single IC doubler to give 10 MHz from a 5 MHz reference osc.

Signal Outputs:
 - The "raw" frequency standard signal is looped thru via a 10 dB SMT
   directional coupler
 - 1 PPS, 1 kHz and a digital replica of the input, all driven by isolated
   Lo-Z 0/+5V digital drivers (using a circuit similar to the output drivers
   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
   connectors. The 1 PPS output has a 20%/80% duty cycle like the ONCORE.
   The 1 kHz output is a 40/60% (nearly) square-wave.

Divider Synchronization: A CMOS level GPS 1PPS signal (like from a TAC-2)
  can be input to a PCB mounted BNC so that the divider chain can be synched
  to GPS time.

Temp Monitor: For my application I needed temperature logging capability,
  so the PCB includes an RJ11 connector and room for two Dallas One-Wire
  DS1820 (TO92 case) temperature monitors (ignore if you don't need them).

Power: +12V is regulated down to +5V with onboard 7805.

Since the parts are easy to get from DigiKey, I'll probably just supply a
couple of the harder to get parts (like the MiniCircuits widgets that have
qty=25 ordering restrictions). But if the demand is there, I might consider
doing a full parts kit.

So please let me know if there is any interest (and your preferences on bare
PCB vs kit).

73, Tom

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----
Mail2Web - Check your email from the web at
http://www.mail2web.com/ .

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28. [tacgps] newbie question

From: "Allan Liu" <a_guy94606@yahoo.com>
Date: Wed, 29 Aug 2001 16:46:27

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33131-2001.08.29-17.09.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi,

I am new to the entire issue of time. I am currently trying to build a box
to measure network performance. One of the things that I will need is an
accurate timestamp, down to the 100 microseconds. I have been doing a bit
of reading on the web and I believe I know how to accomplish this using a
GPS receiver with ASCII date/time output and a 1PPS output.

I don't understand what the TAC2 platform provides that the Garmin GPS25
does not provide. In other words, why would I need to buy a TAC2 kit. As
I understand from Garmin's datasheet, the GPS25 board offers both an ASCII
date/time output as well as a 1PPS output. Am I missing something?
Thanks.

Regards,

-Allan

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29. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: GS <gsanders1@bigfoot.com>
Date: Wed, 29 Aug 2001 21:20:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33169-2001.08.29-20.44.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr. Tom Clark" wrote:
>
> So please let me know if there is any interest (and your preferences on bare
> PCB vs kit).

I'd be interested in one, preferably a kit, but a bare board with the
hard to find parts would be fine also.

Gary Sanders

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30. [tacgps] RE: tacgps digest: August 29, 2001 <LYR25064-33217-2001.08.30-00.00.46--sas#luxonics.com@lists.tapr.org>

From: Steve Share <sas@luxonics.com>
Date: Wed, 29 Aug 2001 21:53:17 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33219-2001.08.30-00.21.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

I'd be interested in 2, kits preferred over PCB only.

Thanks,

Steve Share

> Subject: 5/10 MHz => 1PPS PCBs. Interest?
> From: "Dr. Tom Clark" <tac@clark.net>
> Date: Wed, 29 Aug 2001 01:21:22 -0400
> X-Message-Number: 1
>
> Some of you may recall that a couple of years ago I posted
> the schematic
> for a divider chain to bring your 5/10 MHz frequency standard
> down to 1PPS.
> In conjunction with a project I'm doing, I had the need to
> dust off that

> design and make it into a PCB. In the next couple of weeks
> I'm going to send
> the board off to the PCB house to have a number of copies
> made and I'd like
> to know if any of you would like copies. You can see the
> essence of the
> schematic (the U1-U4 string) at URL
>   ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.
>
> Except for a couple of MiniCircuit parts, all the parts are
> straight out of
> the DigiKey catalog
> and the PCB is designed to drop into a cheap case available
> from DigiKey if
> you want it to look nice.
>
> Here are some of the salient features:
>
> Frequency Standard Input: 5 or 10 MHz, jumper selected. Your
> standard feeds
>   a directional coupler and amplifier (the MiniCircuits
> parts) so that the
>   counter is isolated from the signal source. Normally the
> 5/10 MHz in/out
>   is via PCB mounted BNCs, but the board has a large 0.1"
> grid kludge area,
>   so you can mount a VCXO or TCXO "can" on the PCB. The
> kludge area could
>   house a single IC doubler to give 10 MHz from a 5 MHz reference osc.
>
> Signal Outputs:
> - The "raw" frequency standard signal is looped thru via a 10 dB SMT
>   directional coupler
> - 1 PPS, 1 kHz and a digital replica of the input, all
> driven by isolated
>   Lo-Z 0/+5V digital drivers (using a circuit similar to the
> output drivers
>   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
>   connectors. The 1 PPS output has a 20%/80% duty cycle like
> the ONCORE.
>   The 1 kHz output is a 40/60% (nearly) square-wave.
>
> Divider Synchronization: A CMOS level GPS 1PPS signal (like
> from a TAC-2)
>   can be input to a PCB mounted BNC so that the divider chain
> can be synched
>   to GPS time.
>
> Temp Monitor: For my application I needed temperature logging
> capability,
>   so the PCB includes an RJ11 connector and room for two
> Dallas One-Wire
>   DS1820 (TO92 case) temperature monitors (ignore if you
> don't need them).
>
> Power: +12V is regulated down to +5V with onboard 7805.
>
> Since the parts are easy to get from DigiKey, I'll probably
> just supply a
> couple of the harder to get parts (like the MiniCircuits
> widgets that have
> qty=25 ordering restrictions). But if the demand is there, I
> might consider
> doing a full parts kit.
>
> So please let me know if there is any interest (and your
> preferences on bare
> PCB vs kit).
>
> 73, Tom

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31. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: "Robert H. Hamstra, Jr." <rhamstra@cirsol.com>
Date: Wed, 29 Aug 2001 22:15:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33220-2001.08.30-00.41.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi,

I am interested in one bare PCB with MiniCircuit parts, if possible.

Thanks,

Bob Hamstra

At 01:21 8/29/01 -0400, you wrote:
>Some of you may recall that a couple of years ago I posted the schematic
>for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.

  Robert H. Hamstra, Jr. - Circuit Solutions, San Jose, CA 95129
  RHamstra@CirSol.com Voice: (408) 996-2166 Fax: (408) 446-9471
  http://www.cirsol.com

32. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: clemens@dwf.com
Date: Thu, 30 Aug 2001 00:41:52 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33224-2001.08.30-02.05.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Id be interested in one.
A kit would be easier, but the bare board+ would be fine.

--
Reg.Clemens
reg@dwf.com

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33. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: Boyd Prestwood K5YKG <k5ykg@netcarrier.com>
Date: Thu, 30 Aug 2001 03:01:45 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33226-2001.08.30-02.25.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

"Dr. Tom Clark" wrote:

> Some of you may recall that a couple of years ago I posted the schematic
> for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.

Sounds like another fun project. I'd be interested in a bare board or kit,
whatever you decide to put together. Thanks for the offering.

Boyd Prestwood, K5YKG

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34. [tacgps] Re: newbie question

From: John Ackermann N8UR <jra@febo.com>
Date: Thu, 30 Aug 2001 08:19:56 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33246-2001.08.30-07.43.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0b3 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit

Content-Disposition: inline

--On Wednesday, August 29, 2001 4:46 PM +0000 Allan Liu
<a_guy94606@yahoo.com> wrote:

> Hi,
>
> I am new to the entire issue of time. I am currently trying to build a
> box to measure network performance. One of the things that I will need
> is an accurate timestamp, down to the 100 microseconds. I have been
> doing a bit of reading on the web and I believe I know how to accomplish
> this using a GPS receiver with ASCII date/time output and a 1PPS output.
>
> I don't understand what the TAC2 platform provides that the Garmin GPS25
> does not provide. In other words, why would I need to buy a TAC2 kit.
> As I understand from Garmin's datasheet, the GPS25 board offers both an
> ASCII date/time output as well as a 1PPS output. Am I missing
> something? Thanks.

Hi Allan --

The TAC provides a fairly elegant interface to the Garmin or Motorola GPS
receiver. You can get the 1PPS off the receiver without it, but it
provides regulated voltage for the receiver, two serial ports, and two
low-Z buffered 1PPS outputs. Just makes life a bit easier than having to
haywire everything to the 10 pin connector on the receiver.

John

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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35. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: "Dr. Tom Clark" <tac@clark.net>
Date: Thu, 30 Aug 2001 23:58:11 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33390-2001.08.30-23.21.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks to all for the quick reply. So far the requests total about 30, so
this will clearly justify doing an extra run. I got the prototype running
fine yesterday.

First, let me give a brief explanation on why I'm doing this board. In June
I decided to retire from NASA/GSFC (although I still have a presence there
as an Emeritus scientist). I took on a part-time relation as a Senior
Scientist at Syntonics (http://www.SyntonicsCorp.com) -- this firm spun off
from Johns Hopkins Applied Physics Lab to commercialize the extremely
high-quality xtal oscillators that JPL had provided for many DoD and Deep
Space missions.

At Syntonics, I have been working on developing techniques to array N
oscillators to try to extract a sqrt(N) performance improvement as well as
improved reliability. To try to design the optimum combiner, it became
obvious that we needed a good statistical characterization of just what is
noisy in various oscillators and what effects performance.

To do this, I decided that we needed to be able to measure the Allan
Variance on a number of oscillators of different degrees of "goodness" --
ranging from Rubes and high quality xtals all the way down to cheap crystal
can oscillators. To accomplish this we have adapted Rick's TAC32Plus so that
it can support simultaneous TIC measurements on up to 8 HP53131/2 counters,
and I developed the small "test pod" divider chain that I described to you a
couple of days ago. Right now we are doing 3-way tests to see if we can
identify "problem children" from their integrated time-difference
performance.

In case you'd like to see more about the divider PCB I've been working on,
the schematic is posted for review on my NASA/GSFC FTP server at
ftp://aleph.gsfc.nasa.gov/GPS/dividers/tac-div.pdf and a photo of the PCB
can be seen at ftp://aleph.gsfc.nasa.gov/GPS/dividers/tac-div.jpg. In the
photo you see the PCB resting in the bottom half of the cheap Hammond box
that the project was designed to fit into.

Let me answer a couple of questions that were raised after my initial
posting. Jeff Vollin questioned the fact that I used simple ripple counters
(74HC390s) instead of more quiet synchronous counters. The basic answer is
that the project I described is based on the longer term Allan Variance
details. Short-term "phase" noise from the ripple counters is pretty
irrelevant. Simplicity/cost considerations led to the use of simple ripple
counters (but on the initial prototype I'm seeing pulse-to-pulse jitter of a
nsec or less even with the ripple counters). I agree that the best approach
would be to use an FPGA, but I'm still illiterate (and lacking design tools)
in VHDL!

Glenn Little pointed out that the DS1820 is an obsolete part, now replaced
by the 18S20. Yep -- I just used the "1820" name to describe the generic
device type. When you look at the photo, you will see the holes for the
18S20 indicated; the DC power and RJ11 1-wire LAN connects thru a
single-piece Hirose connector mounted on the PCB (although for right now,
power for the unit under test is coming thru the red/blk twisted pair). This
was included because >>THE<< principal effect on xtal oscillators comes from
their temperature environment. As the "test pod" is cycled, I wanted to be
able to follow the temperature of the oscillator can. I've also been using
the DS1920 iButton version of the 1820, and the DS1921 temperature logging
iButton is really a neat tool.

73, Tom

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36. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: "Dr. Tom Clark" <tac@clark.net>
Date: Fri, 31 Aug 2001 00:05:47 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "TACGPS" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33392-2001.08.30-23.29.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Lyle asked (while I was typing in my other message):

> Any idea of the price for aboard and the hard-to-get parts? I'm
> interested, I think :-)

Don't know PCB costs yet. There are only a couple on hard-to-get (i.e.
non-DigiKey) parts, a ~$6 SMT 9dB direction coupler and an $2 ERA-3 MMIC.
The only reason they are hard to get is the MiniCircuits has a order
minimum.

The PCB BNCs and the Hammond cabinet are the most expensive parts.
Everything else is pure Popcorn!

> Want to put all the logic in a single CPLD or FPGA?

I sorta answered this in my posting of a few minutes ago. That's a
technology I need to learn. But because this device is price dominated by
cabinet, connectors and SMT RF parts, I doubt that an FPGA would save much.

73, Tom

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37. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: "Holger Hey Mortensen" <ox3hi@greennet.gl>
Date: Fri, 31 Aug 2001 09:02:06 -0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33421-2001.08.31-04.26.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hej Tom
I am interested in one bare PCB with MiniCircuit parts, if possible.

 Thanks

Holger Mortensen / OX3HI

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38. [tacgps] Re>RE: 5/10 MHz => 1PPS PCBs. Interest?

From: Bill Powell <bpowell@intrex.net>
Date: Fri, 31 Aug 2001 08:31:45 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33429-2001.08.31-07.58.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,
I'd be interested in 4 boards/hard to find parts, or any grouping of
parts that includes the boards.

Thanks,
Bill Powell af4jg
bpowell@intrex.net

"Dr. Tom Clark" wrote:
>
> Thanks to all for the quick reply. So far the requests total about 30, so
> this will clearly justify doing an extra run. I got the prototype running
> fine yesterday.
>
> First, let me give a brief explanation on why I'm doing this board. In June
> I decided to retire from NASA/GSFC (although I still have a presence there
> as an Emeritus scientist). I took on a part-time relation as a Senior
> Scientist at Syntonics (http://www.SyntonicsCorp.com) -- this firm spun off
> from Johns Hopkins Applied Physics Lab to commercialize the extremely
> high-quality xtal oscillators that JPL had provided for many DoD and Deep
> Space missions.
>
> At Syntonics, I have been working on developing techniques to array N
> oscillators to try to extract a sqrt(N) performance improvement as well as
> improved reliability. To try to design the optimum combiner, it became
> obvious that we needed a good statistical characterization of just what is
> noisy in various oscillators and what effects performance.
>
> To do this, I decided that we needed to be able to measure the Allan
> Variance on a number of oscillators of different degrees of "goodness" --
> ranging from Rubes and high quality xtals all the way down to cheap crystal
> can oscillators. To accomplish this we have adapted Rick's TAC32Plus so that
> it can support simultaneous TIC measurements on up to 8 HP53131/2 counters,
> and I developed the small "test pod" divider chain that I described to you a
> couple of days ago. Right now we are doing 3-way tests to see if we can
> identify "problem children" from their integrated time-difference
> performance.
>
> In case you'd like to see more about the divider PCB I've been working on,
> the schematic is posted for review on my NASA/GSFC FTP server at
> ftp://aleph.gsfc.nasa.gov/GPS/dividers/tac-div.pdf and a photo of the PCB
> can be seen at ftp://aleph.gsfc.nasa.gov/GPS/dividers/tac-div.jpg. In the
> photo you see the PCB resting in the bottom half of the cheap Hammond box
> that the project was designed to fit into.
>
> Let me answer a couple of questions that were raised after my initial
> posting. Jeff Vollin questioned the fact that I used simple ripple counters
> (74HC390s) instead of more quiet synchronous counters. The basic answer is
> that the project I described is based on the longer term Allan Variance
> details. Short-term "phase" noise from the ripple counters is pretty
> irrelevant. Simplicity/cost considerations led to the use of simple ripple
> counters (but on the initial prototype I'm seeing pulse-to-pulse jitter of a
> nsec or less even with the ripple counters). I agree that the best approach
> would be to use an FPGA, but I'm still illiterate (and lacking design tools)
> in VHDL!
>
> Glenn Little pointed out that the DS1820 is an obsolete part, now replaced
> by the 18S20. Yep -- I just used the "1820" name to describe the generic
> device type. When you look at the photo, you will see the holes for the
> 18S20 indicated; the DC power and RJ11 1-wire LAN connects thru a
> single-piece Hirose connector mounted on the PCB (although for right now,
> power for the unit under test is coming thru the red/blk twisted pair). This
> was included because >>THE<< principal effect on xtal oscillators comes from
> their temperature environment. As the "test pod" is cycled, I wanted to be

> able to follow the temperature of the oscillator can. I've also been using
> the DS1920 iButton version of the 1820, and the DS1921 temperature logging
> iButton is really a neat tool.
>
> 73, Tom
>
> ---
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---
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39. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: Dietmar Grossmann <dj4rx@gmx.de>
Date: Fri, 31 Aug 2001 16:04:54 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33443-2001.08.31-09.28.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

I´d be interested in two PCBs with MiniCircuit parts to help reach the minimum order, but kits would also be
welcome. Thanks for the offering.

Dietmar Grossmann, DJ4RX

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40. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 31 Aug 2001 08:59:56 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33486-2001.08.31-11.23.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom-

I'd be interested in a single board and teh minicircuits parts.
Thanks es 73,

Dan - W6LSN

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41. [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?

From: jim_johnson@agilent.com
Date: Fri, 31 Aug 2001 10:09:39 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33495-2001.08.31-12.33.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

   I didn't want to bother the list with my question but
I can't find a personal email address for you. I'm wondering
about the "optimum combiner" you mention below. What characteristic(s)
are you trying to optimize? What would be the downside of just
buying a combiner/splitter out of a catalog from a vendor?

   Thanks,

   Jim, W6SC
   Agilent Labs
   Palo Alto, CA
   jim_johnson@agilent.com

> -----Original Message-----

> From: Dr. Tom Clark [mailto:tac@clark.net]
> Sent: Thursday, August 30, 2001 8:58 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: 5/10 MHz => 1PPS PCBs. Interest?
>
>
> At Syntonics, I have been working on developing techniques to array N
> oscillators to try to extract a sqrt(N) performance
> improvement as well as
> improved reliability. To try to design the optimum combiner, it became
> obvious that we needed a good statistical characterization of
> just what is
> noisy in various oscillators and what effects performance.
>

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September 2001

Original source file: tacgps.0109
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0109

1. [tacgps] Cheap Rub's

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Sat, 1 Sep 2001 03:48:19 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33652-2001.09.01-04.13.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Efratom FRK rubidium oscillators,
        10 MHz sine out, 24 VDC $350
        Vigilante Electronics
        http://www.vigilante-electronics.com/

2. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: "Robert Menzies" <ve3gkm@windsor.igs.net>
Date: Sat, 1 Sep 2001 23:50:55 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-33763-2001.09.01-23.14.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom

        I would also be interested in a 1 PPS PCB and parts kit.

73 Bob

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3. [tacgps] Selling products

From: jim_johnson@agilent.com
Date: Tue, 4 Sep 2001 10:48:19 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34170-2001.09.04-13.12.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

   I don't remember the rules about advertising items for sale
(private individuals) on this list. A friend has a Rb standard he's
trying to sell. Is there a more appropriate list on which to post
his item than this list?

   Trying to follow the rules ... thanks,
   Jim W6SC

  Jim Johnson
  Agilent Laboratories
  Palo Alto, CA
  jim_johnson@agilent.com

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4. [tacgps] Re: Selling products

From: John Ackermann   N8UR <jra@febo.com>
Date: Tue, 04 Sep 2001 15:26:07 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34179-2001.09.04-14.49.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0 (Win32)
MIME-Version: 1.0

Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

I guess I'll speak for TAPR as the list owner on this one. I don't see any
problem with the occasional on-topic sale, wanted, etc. posting. I'm
pretty sure that the gang here is mature enough to exercise appropriate
restraint and not let things get out of hand. So, post away.

John

--On Tuesday, September 04, 2001 10:48 AM -0700 jim_johnson@agilent.com
wrote:

> Hello,
>
>   I don't remember the rules about advertising items for sale
> (private individuals) on this list. A friend has a Rb standard he's
> trying to sell. Is there a more appropriate list on which to post
> his item than this list?
>
>   Trying to follow the rules ... thanks,
>   Jim W6SC
>
>   ---------------------------------------
>
>   Jim Johnson
>   Agilent Laboratories
>   Palo Alto, CA
>   jim_johnson@agilent.com
>
>
>
> ---
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>
>
>

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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5. [tacgps] Re: Selling products

From: jim_johnson@agilent.com
Date: Tue, 4 Sep 2001 14:52:20 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34189-2001.09.04-17.16.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi John,

   Thanks for your reply. Here's the info on the Rb for
sale, written by the owner. Interested parties can contact
me and I will forward their information on to him.

73,
Jim
jim_johnson@agilent.com

==========
I'm the guy with 2 Efratom FRS that are no longer needed... I'm now using a
pair of MTI-260 double oven 5 MHz quartz OCXO with Brooks Shera's GPS
controller. The MTI is a superb double oven device and has better short term
stability than the Rb. GPS discipline takes care of long term stability.

The FRS is identical to the one shown in this completed sale... same model,
bought from the same seller for $450, and still in excellent condition:

http://cgi.ebay.com/aw-cgi/eBayISAPI.dll?ViewItem&item=1626267140

I'll be selling each with all of the materials originally supplied (heat
sink, Xerox copy of manual, 18 MHz LP filter, etc), as well as a Hitron
24VDC/2.5A desktop switcher that has over voltage and short circuit
protection built in. I'm thinking $400 each delivered... maybe a bit less as
they now have a couple of months use on the lamps. I've also calibrated each
to a few parts in 10E-11 with respect to the GPS disciplined quartz.

==========

> -----Original Message-----
> From: John Ackermann N8UR [mailto:jra@febo.com]
> Sent: Tuesday, September 04, 2001 12:26 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Selling products
>
>
>
> I guess I'll speak for TAPR as the list owner on this one. I
> don't see any
> problem with the occasional on-topic sale, wanted, etc. posting. I'm
> pretty sure that the gang here is mature enough to exercise
> appropriate
> restraint and not let things get out of hand. So, post away.
>
> John
>

> --On Tuesday, September 04, 2001 10:48 AM -0700
> jim_johnson@agilent.com
> wrote:
>
> > Hello,
> >
> >   I don't remember the rules about advertising items for sale
> > (private individuals) on this list. A friend has a Rb standard he's
> > trying to sell. Is there a more appropriate list on which to post
> > his item than this list?
> >
> >   Trying to follow the rules ... thanks,
> >   Jim W6SC
> >
> >   ---------------------------------------
> >
> >   Jim Johnson
> >   Agilent Laboratories
> >   Palo Alto, CA
> >   jim_johnson@agilent.com
> >
> >

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6. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: Rich Amundson <wa0jfs@raccoon.com>
Date: Wed, 05 Sep 2001 19:11:57 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34399-2001.09.05-20.24.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,

I am finally getting time to complete the assembly of the TAC-2 I bought at
Dayton this spring. I haven't had to time to really peruse the circuit on the
web site. I still haven't gotten to thinking about a oscillator I can tie to
the TAC to generate a more precise time base for a counter and service monitor I
use in the shack. If this will do that, or reasonably close, put me down for
one and at least the hard to find parts, as Des Moines, IA isn't quite Siberia,
but for electronics components, you can see it from here.

Hope your "retirement" is going well and will see you later.

Rich Amundson WA0JFS
wa0jfs@raccoon.com

"Dr. Tom Clark" wrote:

> Some of you may recall that a couple of years ago I posted the schematic
> for a divider chain to bring your 5/10 MHz frequency standard down to 1PPS.
> In conjunction with a project I'm doing, I had the need to dust off that
> design and make it into a PCB. In the next couple of weeks I'm going to send
> the board off to the PCB house to have a number of copies made and I'd like
> to know if any of you would like copies. You can see the essence of the
> schematic (the U1-U4 string) at URL
>   ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.
>
> Except for a couple of MiniCircuit parts, all the parts are straight out of
> the DigiKey catalog
> and the PCB is designed to drop into a cheap case available from DigiKey if
> you want it to look nice.
>
> Here are some of the salient features:
>
> Frequency Standard Input: 5 or 10 MHz, jumper selected. Your standard feeds
>   a directional coupler and amplifier (the MiniCircuits parts) so that the
>   counter is isolated from the signal source. Normally the 5/10 MHz in/out
>   is via PCB mounted BNCs, but the board has a large 0.1" grid kludge area,
>   so you can mount a VCXO or TCXO "can" on the PCB. The kludge area could
>   house a single IC doubler to give 10 MHz from a 5 MHz reference osc.
>
> Signal Outputs:
> - The "raw" frequency standard signal is looped thru via a 10 dB SMT
>   directional coupler
> - 1 PPS, 1 kHz and a digital replica of the input, all driven by isolated
>   Lo-Z 0/+5V digital drivers (using a circuit similar to the output drivers
>   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
>   connectors. The 1 PPS output has a 20%/80% duty cycle like the ONCORE.
>   The 1 kHz output is a 40/60% (nearly) square-wave.
>
> Divider Synchronization: A CMOS level GPS 1PPS signal (like from a TAC-2)
>   can be input to a PCB mounted BNC so that the divider chain can be synched
>   to GPS time.
>
> Temp Monitor: For my application I needed temperature logging capability,
>   so the PCB includes an RJ11 connector and room for two Dallas One-Wire
>   DS1820 (TO92 case) temperature monitors (ignore if you don't need them).
>
> Power: +12V is regulated down to +5V with onboard 7805.
>
> Since the parts are easy to get from DigiKey, I'll probably just supply a
> couple of the harder to get parts (like the MiniCircuits widgets that have
> qty=25 ordering restrictions). But if the demand is there, I might consider
> doing a full parts kit.
>
> So please let me know if there is any interest (and your preferences on bare
> PCB vs kit).
>
> 73, Tom
>
> ---
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7. [tacgps] Re: 5/10 MHz => 1PPS PCBs. Interest?

From: "Russ Chadwick" <crb5@qwest.net>
Date: Wed, 5 Sep 2001 22:09:27 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34414-2001.09.05-23.33.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tom,

Would you please put my name on the list for two of the boards with the
MiniCircuit parts? Thanks.

Russ   KB0TVJ
Boulder, CO
http://www.users.qwest.net/~crb5/

----- Original Message -----
From: Dr. Tom Clark <tac@clark.net>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Tuesday, August 28, 2001 11:21 PM
Subject: [tacgps] 5/10 MHz => 1PPS PCBs. Interest?

> Some of you may recall that a couple of years ago I posted the schematic
> for a divider chain to bring your 5/10 MHz frequency standard down to
1PPS.
> In conjunction with a project I'm doing, I had the need to dust off that
> design and make it into a PCB. In the next couple of weeks I'm going to
send
> the board off to the PCB house to have a number of copies made and I'd
like
> to know if any of you would like copies. You can see the essence of the
> schematic (the U1-U4 string) at URL
>   ftp://aleph.gsfc.nasa.gov/GPS/toc/rubidium/counters.pdf.
>
> Except for a couple of MiniCircuit parts, all the parts are straight out
of
> the DigiKey catalog
> and the PCB is designed to drop into a cheap case available from DigiKey
if
> you want it to look nice.
>
> Here are some of the salient features:
>
> Frequency Standard Input: 5 or 10 MHz, jumper selected. Your standard
feeds
>   a directional coupler and amplifier (the MiniCircuits parts) so that
the
>   counter is isolated from the signal source. Normally the 5/10 MHz in/out
>   is via PCB mounted BNCs, but the board has a large 0.1" grid kludge
area,
>   so you can mount a VCXO or TCXO "can" on the PCB. The kludge area could
>   house a single IC doubler to give 10 MHz from a 5 MHz reference osc.
>
> Signal Outputs:
> - The "raw" frequency standard signal is looped thru via a 10 dB SMT
>   directional coupler
> - 1 PPS, 1 kHz and a digital replica of the input, all driven by isolated
>   Lo-Z 0/+5V digital drivers (using a circuit similar to the output
drivers
>   I used for the 1PPSoutputs on the TAC-2 board) with PCB-mounted BNC
>   connectors. The 1 PPS output has a 20%/80% duty cycle like the ONCORE.
>   The 1 kHz output is a 40/60% (nearly) square-wave.
>
> Divider Synchronization: A CMOS level GPS 1PPS signal (like from a TAC-2)
>   can be input to a PCB mounted BNC so that the divider chain can be
synched
>   to GPS time.
>
> Temp Monitor: For my application I needed temperature logging capability,
>   so the PCB includes an RJ11 connector and room for two Dallas One-Wire
>   DS1820 (TO92 case) temperature monitors (ignore if you don't need them).
>
> Power: +12V is regulated down to +5V with onboard 7805.
>
> Since the parts are easy to get from DigiKey, I'll probably just supply a
> couple of the harder to get parts (like the MiniCircuits widgets that have
> qty=25 ordering restrictions). But if the demand is there, I might
consider
> doing a full parts kit.
>
> So please let me know if there is any interest (and your preferences on
bare
> PCB vs kit).
>
> 73, Tom
>
>
> ---
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>
>

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8. [tacgps] Re: 5/10 MHz => 1PPS PCBs

From: Jeremy Nichols <jeremynichols@sprintmail.com>
Date: Wed, 05 Sep 2001 22:50:19 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34438-2001.09.06-01.05.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Please put me down for one PCB and the MiniCircuit parts.

Thanks for the offer.
Jeremy Nichols

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9. [tacgps] DCC: Last chance for registration discount, and updated program info

From: John Ackermann N8UR <jra@febo.com>
Date: Fri, 07 Sep 2001 12:50:15 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-34730-2001.09.07-12.18.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The early registration discount for both the hotel room rate, and the
registration fee, expires on September 10, so you only have a couple more
days to get your reservations and registration made at the lowest price.
Registrations at the normal price will be available and at the door (of
course, hotel rooms will be subject to availability).

The DCC begins on Friday, September 20 and runs through Sunday, September
22. Full details are available at
http://www.tapr.org/tapr/html/Fdccconf.html.

A couple of updates on the program:

1. We're very happy that Anthony R. Curtis, Ph.D, K3RXK, will be our
speaker at the DCC banquet. Tony's presentation will be titled "40 Years
of Amateur Radio In Space: Where We've Been, Where We Are, and Where We're
Going."

2. We've confirmed that the Packet Radio Users Group (PRUG) of Tokyo,
Japan will be sponsoring a reception and talking about their latest
activities Friday evening. PRUG is really on the cutting edge of digital
radio, and their presentations are always fascinating.

3. We are also fortunate to have three great activities that focus on the
hardware and soldering-iron side of amateur radio:

        * On Saturday, Jay Craswell, W0VNE, will do an introductory program on
using
        CirCAD, a powerful schematic drawing/PCB layout program that's available
(in a
        slightly limited form) for ham use at no cost.

        * Also on Saturday, Ten-Tec's Gary Barbour, AC4DL, will be talking about
Software
        Defined Radio development at Ten-Tec.

        * Our "Sunday Seminar" will feature Dave Newkirk, W9VES, providing a
tutorial
        on using the Serenade SV RF design software; this is another professional
package
        with a free version available for ham use.

We hope to see you there!

John N8UR
President, TAPR
jra@febo.com -- n8ur@tapr.org

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10. [tacgps] Correction to DCC Post

From: "John R. Ackermann" <jra@febo.com>
Date: Sat, 08 Sep 2001 20:22:57 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: mvarbb@febo.com, tawg-list@tawg.org
Message-ID: <LYR6754-34981-2001.09.08-19.50.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In a previous email I incorrectly stated that the Circad schematic drawing
and PCB layout program is available for Ham use at no cost. I
misunderstood the relationship of the various versions.

There is a highly discounted version of the $995 Circad program available
at $295.   This $295 version is available to Licensed Ham/Amateur Radio
Operators only. Check out http://dover.5u.com/ for more info on the Ham
Discount.

There is a demo version of Circad downloadable at http://www.holophase.com;
although that version can be used to draw small schematics and PCBs, it's
not a replacement for the full program.

I want to apologize to Holophase and to Jay Craswell for improperly
describing the versions of Circad, and to you for any confusion this may
have caused.

73,
John N8UR
President, TAPR
jra@febo.com -- n8ur@tapr.org

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11. [tacgps] GPS Engines with WAAS

From: "Kelly Jordan" <kjordan@marathon.lakeheadu.ca>
Date: Sun, 9 Sep 2001 08:33:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35080-2001.09.09-07.57.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anybody make 12 channel GPS receiver engines with WAAS
capabilities?

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12. [tacgps] Re: GPS Engines with WAAS

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Sun, 09 Sep 2001 08:28:25 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35111-2001.09.09-10.51.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Kelly,

The Garmin GPS76, a complete receiver, is a 12-channel unit with WAAS. I
don't think it has been produced in an OEM version yet. I suspect most
manufacturers are waiting for TDRS-J or some other satellite to be placed
in position over the central states, so that WAAS signals can be received
more reliably. Here in California, the POR satellite is so low on the
horizon that its availability to a WAAS receiver on the ground is
remarkably low. AOR-W is almost never available to me.

73, Eric Lemmon WB6FLY

Kelly Jordan wrote:

> Does anybody make 12 channel GPS receiver engines with WAAS capabilities?

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13. [tacgps] Re: GPS Engines with WAAS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 09 Sep 2001 13:05:37 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35167-2001.09.09-13.28.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'll try to remember to check the GPSWorld receiver summary and let you
know.

Do you have a particular application requiring 12 channels, or is this
simply a case of keeping up with the technology?

73, gerry
--
Kelly Jordan wrote:
>
> Does anybody make 12 channel GPS receiver engines with WAAS
> capabilities?
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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14. [tacgps] Re: GPS Engines with WAAS

From: "Kelly Jordan" <kjordan@marathon.lakeheadu.ca>
Date: Sun, 9 Sep 2001 20:46:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35233-2001.09.09-20.11.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry,

Keeping current. Thanks for taking the time to check.

- Kelly

> I'll try to remember to check the GPSWorld receiver summary and let you
> know.
>
> Do you have a particular application requiring 12 channels, or is this
> simply a case of keeping up with the technology?
>
> 73, gerry

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15. [tacgps] Re: GPS Engines with WAAS

From: "Kelly Jordan" <kjordan@marathon.lakeheadu.ca>
Date: Sun, 9 Sep 2001 20:46:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35234-2001.09.09-20.35.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Eric,

I will most likely get myself a Garmin GPS V after it is released next month
to replace my Garmin GPS 12 for use on my snowmobile and atv. Most
likely will give the 12 to my dad.

Looking for an engine type unit for tracking use.

- Kelly

> Kelly,

>
> The Garmin GPS76, a complete receiver, is a 12-channel unit with WAAS. I
> don't think it has been produced in an OEM version yet. I suspect most
> manufacturers are waiting for TDRS-J or some other satellite to be placed
> in position over the central states, so that WAAS signals can be received
> more reliably. Here in California, the POR satellite is so low on the
> horizon that its availability to a WAAS receiver on the ground is
> remarkably low. AOR-W is almost never available to me.
>
> 73, Eric Lemmon WB6FLY

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16. [tacgps] Re: GPS Engines with WAAS

From: Gary Mastenbrook <n8dmt@home.com>
Date: Sun, 09 Sep 2001 21:14:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35240-2001.09.09-21.37.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Guess I've missed the "big thing" about WAAS for the common user. How
does this add value to your "tracking use" compared to the performance
you would achieve with a standard 8ch Mot GT in NMEA mode?

(I'm interested to learn more about how 12 channels and WAAS performs
"better" than the older 8ch Motorola receivers [GT and/or UT],
especially since I have several of each of these types which I will be
making available in the next couple of months. Its almost time to clean
out the closet, but maybe they're not worth enough to bother with
anymore? :o)

73's

Gary N8DMT
n8dmt@arrl.net
www.qsl.net/n8dmt

Kelly Jordan wrote:
>
> Eric,
>
> I will most likely get myself a Garmin GPS V after it is released next month
> to replace my Garmin GPS 12 for use on my snowmobile and atv. Most
> likely will give the 12 to my dad.
>
> Looking for an engine type unit for tracking use.
>
> - Kelly
>
> > Kelly,
> >
> > The Garmin GPS76, a complete receiver, is a 12-channel unit with WAAS. I
> > don't think it has been produced in an OEM version yet. I suspect most
> > manufacturers are waiting for TDRS-J or some other satellite to be placed
> > in position over the central states, so that WAAS signals can be received
> > more reliably. Here in California, the POR satellite is so low on the
> > horizon that its availability to a WAAS receiver on the ground is
> > remarkably low. AOR-W is almost never available to me.
> >
> > 73, Eric Lemmon WB6FLY
>
> ---
> You are currently subscribed to tacgps as: gemastenbrook@myrealbox.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: GPS Engines with WAAS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sun, 09 Sep 2001 21:50:54 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35250-2001.09.09-22.14.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Depends on the application. If you want mor'r'less 6m accuracy,
autonomous positioning with an 8-channel parallel receiver and a decent
antenna is usually just fine. If you need 1m "anywhere," then, when
TDRS-R is in place, and we have decent CONUS coverage, WAAS will provide
that. Until then, you probably want to get a CSI receiver and snag the
MF beacons associated with USCG and FRA augmentation.

Gerry
--
Gary Mastenbrook wrote:
>
> Guess I've missed the "big thing" about WAAS for the common user. How
> does this add value to your "tracking use" compared to the performance
> you would achieve with a standard 8ch Mot GT in NMEA mode?
>
> (I'm interested to learn more about how 12 channels and WAAS performs
> "better" than the older 8ch Motorola receivers [GT and/or UT],
> especially since I have several of each of these types which I will be
> making available in the next couple of months. Its almost time to clean
> out the closet, but maybe they're not worth enough to bother with
> anymore? :o)

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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18. [tacgps] Re: GPS Engines with WAAS

From: "ztn" <tienanzh@netease.com>
Date: Mon, 10 Sep 2001 12:30:37 +0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35254-2001.09.09-23.58.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Javad Receiver...
WAAS is an option.

----- Original Message -----
From: "Kelly Jordan" <kjordan@marathon.lakeheadu.ca>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, September 09, 2001 8:33 PM
Subject: [tacgps] GPS Engines with WAAS

> Does anybody make 12 channel GPS receiver engines with WAAS
> capabilities?
>

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19. [tacgps] Re: GPS Engines with WAAS

From: Jeff <barnie@flash.net>
Date: Sun, 09 Sep 2001 23:26:52 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35281-2001.09.10-01.51.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My Garmin Vista with WAAS does not seem to meet the 1m Accuracy. I ran
it for a couple hours on two different days, using a roof-mount antenna/preamp
with a re-radiating
element to couple the signal to the Vista. I could reliably receive the WAAS
correction signal, but the 95% confidence level position accuracy was 4.1 and
4.4 meters.
Do you expect WAAS to improve in the future from where it is now, assuming
you can get the signal solidly now? My understanding was WAAS did not really
improve accuracy that much, but rather was needed for its ability to reject
bad
position data. (My data does seem to have fewer points that are "far" from
the reference position, compared with SPS data or even normal DGPS).

Jeff Vollin

Gerry Creager N5JXS wrote:

> Depends on the application. If you want mor'r'less 6m accuracy,
> autonomous positioning with an 8-channel parallel receiver and a decent
> antenna is usually just fine. If you need 1m "anywhere," then, when
> TDRS-R is in place, and we have decent CONUS coverage, WAAS will provide
> that. Until then, you probably want to get a CSI receiver and snag the
> MF beacons associated with USCG and FRA augmentation.
>
> Gerry
> --
> Gary Mastenbrook wrote:
> >
> > Guess I've missed the "big thing" about WAAS for the common user. How
> > does this add value to your "tracking use" compared to the performance
> > you would achieve with a standard 8ch Mot GT in NMEA mode?
> >
> > (I'm interested to learn more about how 12 channels and WAAS performs
> > "better" than the older 8ch Motorola receivers [GT and/or UT],
> > especially since I have several of each of these types which I will be
> > making available in the next couple of months. Its almost time to clean
> > out the closet, but maybe they're not worth enough to bother with
> > anymore? :o)
>
> --
> Gerry Creager -- gerry@cs.tamu.edu
> Network Engineering
> Academy for Advanced Telecommunications and Learning Technologies
> Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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20. [tacgps] Re: GPS Engines with WAAS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 10 Sep 2001 07:18:59 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35317-2001.09.10-07.42.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

When SA was rampant, we expected a fully operational WAAS to provide
5-10m accuracies enroute. With the initial deployment configuration you
see now, WAAS coverage is spotty, so I don't expect it to give full
augmentation enhancement up to its capabilities. As it gets better
coverage, I expect we'll see improvements in its use and performance.

What will be real telling is the additional civil GPS signal L6, and the
receivers designed to provide autonomous and WAAS augmented positions
using multiple civil frequencies. For geodetic and scientific work,
this will be a great enhancement.

I'd hoped to be at ION/GPS this week, but having to perform the duties
of my real employment is going to get in the way of some of my
research. Hopefully Tom Clark will wander the exhibit hall, and let us
know of anything new, great and interesting. And will not try the disco
steps he tried last year.

Gerry
--
Jeff wrote:
>
> My Garmin Vista with WAAS does not seem to meet the 1m Accuracy. I ran
> it for a couple hours on two different days, using a roof-mount antenna/preamp
> with a re-radiating
> element to couple the signal to the Vista. I could reliably receive the WAAS
> correction signal, but the 95% confidence level position accuracy was 4.1 and
> 4.4 meters.
> Do you expect WAAS to improve in the future from where it is now, assuming
> you can get the signal solidly now? My understanding was WAAS did not really
> improve accuracy that much, but rather was needed for its ability to reject
> bad
> position data. (My data does seem to have fewer points that are "far" from
> the reference position, compared with SPS data or even normal DGPS).
>

> Jeff Vollin
>
> Gerry Creager N5JXS wrote:
>
> > Depends on the application. If you want mor'r'less 6m accuracy,
> > autonomous positioning with an 8-channel parallel receiver and a decent
> > antenna is usually just fine. If you need 1m "anywhere," then, when
> > TDRS-R is in place, and we have decent CONUS coverage, WAAS will provide
> > that. Until then, you probably want to get a CSI receiver and snag the
> > MF beacons associated with USCG and FRA augmentation.
> >
> > Gerry
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
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Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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21. [tacgps] Re: GPS Engines with WAAS

From: "Eric G. Lemmon" <elemmon@impulse.net>
Date: Mon, 10 Sep 2001 18:59:28 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35441-2001.09.10-21.22.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> I am curious as to where the "1m" accuracy expectation came from. My own Garmin
> WAAS receiver specs call for a 3-to-5 meter accuracy, and it does meet that-
> provided that the antenna can receive at least six GPS satellites as well as the
> Inmarsat POR bird, and the updates have been received and applied for all
> satellite signals. Given the low elevation of the POR bird in California, that's
> a very tall order- even for three-meter accuracy. Am I too pessimistic?

73, Eric Lemmon WB6FLY

> Jeff Vollin wrote:
> >
> > My Garmin Vista with WAAS does not seem to meet the 1m Accuracy.

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22. [tacgps] Something new

From: "Dr. Tom Clark" <tac@clark.net>
Date: Thu, 13 Sep 2001 11:07:55 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35832-2001.09.13-10.32.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Take a look at the first item on
http://www.westmountainradio.com/optips.htm. Joe, K1JT is a professor at
Princeton and got a Nobel Prize for his detection of General Relativistic
effects on the timing of millisecond binary pulsar. He was also one of the
first users of my TAC. I've known Joe for years, and this posting reflects a
new side I hadn't known.

Tom

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23. [tacgps] Digital Communications Conference Still On

From: John Ackermann   N8UR <jra@febo.com>
Date: Thu, 13 Sep 2001 17:24:05 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-35920-2001.09.13-16.51.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

With the tragic events of this week, we've had to seriously consider
whether it was still appropriate or feasible to hold the Digital
Communications Conference next weekend (Sept. 20-22) in Cincinnati.

Although we grieve with the whole world for the losses so many have
suffered, we believe it's important to show that terrorism will not succeed
in making us change our way of life.

So, the DCC will go on. We realize that in light of the circumstances,
some folks who have already registered may feel they cannot attend. If
that is the case, please contact the TAPR office (tapr@tapr.org) and we
will arrange a refund of your registration fee. If you are traveling to
the DCC, remember that things may still be somewhat disrupted next week,
and increased security precautions will certainly cause some airport
delays. Check with your airline early and often to make sure they haven't
changed your plans for you.

We realize that this year's DCC may well be smaller, and will certainly be
more somber, than in past years. But we think that going ahead is the
right thing to do, and we hope that you agree.

73,
John

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: GPS Engines with WAAS

From: Jeff <barnie@flash.net>
Date: Sun, 16 Sep 2001 23:48:04 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36573-2001.09.17-02.12.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The 1m expectation came from Gerry Creager's post on Sept. 9th. It is not my number,
in fact I was taking exception to this number based upon my own measurements. In a
follow-up post, Gerry said he was not suprised the number was not better now, due
to poor coverage of the WAAS satellites at this time. My response would be that does
not matter, since my measurements were based upon a fixed antenna which could see
the WAAS satellite continuously. Obviously, more WAAS satellites will give us
better accuracy in a moving situation as the signal is lost and re-acquired, but this
was
not the situation for my measurements.

I think the numbers you are quoting are right on.

Jeff Vollin

"Eric G. Lemmon" wrote:

> > I am curious as to where the "1m" accuracy expectation came from. My own Garmin
> > WAAS receiver specs call for a 3-to-5 meter accuracy, and it does meet that-
> > provided that the antenna can receive at least six GPS satellites as well as the
> > Inmarsat POR bird, and the updates have been received and applied for all
> > satellite signals. Given the low elevation of the POR bird in California, that's
> > a very tall order- even for three-meter accuracy. Am I too pessimistic?
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> 73, Eric Lemmon WB6FLY
>
> > Jeff Vollin wrote:
> > >
> > > My Garmin Vista with WAAS does not seem to meet the 1m Accuracy.
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET
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---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: GPS Engines with WAAS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 17 Sep 2001 02:18:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36574-2001.09.17-02.41.29--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

3-5m is consistent with the WAAS specification for dynamic measurements
with good WAAS coverage. As usual with GPS, YMMV. FURTHER, the 3-5m
number was originally derived with Selective Availability in place.
With SA turned off, the result, once we get better coverage, should be
somewhat better accuracies.

Realize that WAAS is designed for improved in-flight accuracies, and for
non-precision approach use.   With that in mind, 3-5m is more than
adequate as an improvement, and is consistent with what one should have
expected with "good" DGPS augmentation in a local area. With SA off, I
usually see, and expect to see 0.6-1m accuracies, or, roughly an order
of magnitude improvement over autonomous position determination (6-10m,
in my recent experience, with SA off). Thus, my 1m suggestion continues
to be reasonable.

We can wander towards discussions of position determination with sparce
augmentation data,if that would help.

73, gerry
--
Jeff wrote:
>
> The 1m expectation came from Gerry Creager's post on Sept. 9th. It is not my number,
> in fact I was taking exception to this number based upon my own measurements. In a
> follow-up post, Gerry said he was not suprised the number was not better now, due
> to poor coverage of the WAAS satellites at this time. My response would be that does
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> the WAAS satellite continuously. Obviously, more WAAS satellites will give us
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> was
> not the situation for my measurements.
>
> I think the numbers you are quoting are right on.
>
> Jeff Vollin
>
> "Eric G. Lemmon" wrote:
>
> > > I am curious as to where the "1m" accuracy expectation came from. My own Garmin
> > > WAAS receiver specs call for a 3-to-5 meter accuracy, and it does meet that-
> > > provided that the antenna can receive at least six GPS satellites as well as the
> > > Inmarsat POR bird, and the updates have been received and applied for all
> > > satellite signals. Given the low elevation of the POR bird in California, that's
> > > a very tall order- even for three-meter accuracy. Am I too pessimistic?
> >
> > 73, Eric Lemmon WB6FLY
> >
> > > Jeff Vollin wrote:
> > > >
> > > > My Garmin Vista with WAAS does not seem to meet the 1m Accuracy.
> >
> > ---
> > You are currently subscribed to tacgps as: BARNIE@FLASH.NET
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Affect of WAAS on altitude accuracy

From: Bob Morris <rmorris@pobox.com>
Date: Mon, 17 Sep 2001 20:37:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36767-2001.09.17-20.02.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have been reading the list with interest regarding the WAAS
discussion.

I have not seen any mention of improvement of altitude accuracy. Does
anyone have info on this?
It seems that though altitude accuracy has improved with S/A turned-off,
it is still not too good.

Bob

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: Affect of WAAS on altitude accuracy

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 18 Sep 2001 03:07:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36782-2001.09.17-22.28.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob Morris wrote:
>
> I have been reading the list with interest regarding the WAAS
> discussion.
>
> I have not seen any mention of improvement of altitude accuracy. Does
> anyone have info on this?
> It seems that though altitude accuracy has improved with S/A turned-off,
> it is still not too good.

Since GPS cannot determine "altitude" but rather height above the
ellipsoid, the answer is more than a little laborious.

First we must recall that the model that GPS works against is the volume
created when an ellipse is rotated about its semiminor axis. This
"ellipsoid" is characterized by its principal parameters, the semimajor
axis (long aspect from the focus) and the index of flattening or, the
inverse of the eccentricity of the equation of the ellipse. This
ellipsoid and the associated datum, or origin and description of
parameters of measurement, are calculated for a variety of purposes. In
the case of the World Geodetic System of 1984, the datum and ellipsoid
are global in nature, and are a particularly good fit overall for the
GPS system; the datum and ellipsoid were developed for GPS,
specifically, by the Defense Mapping Agency, now subsumed into the
National Imagery and Mapping Agency (NIMA). Of particular interest, the
parameters of datum and ellipsoid are extremely similar, to the point of
insignificance for most non-scientific uses, to the North American Datum
of 1983, with periodic adjustments, and its associated ellipsoid, known
as Clarke 1866.

When one talks about 'altitude,' one is usually concerned with height
above either local terrain, or above "mean sea level." In the GPS
world, neither of these has particular meaning as the satellites, and
the receiver, really have no knowledge of the local topography, nor of
the tides and phases of the moon. In fact, the National Geodetic
Vertical Datum of 1929, based on sea-level tide guages and loop closures
between them, is now considered a rather problemmatic datum for vertical
work. The North American Vertical Datum of 1988, completed and accepted
into the national geospatial infrastructure in 1994, is based on a
gravity-referenced system, or "geoid", with the particular reference
geoid currently being Geoid 1999 (and being updated at roughly a 3-year
interval.

When one considers "mean sea level" datums, you must recall that
gravity, and hence "sea level" are influenced by concentrations of
mass. Thus, in a particularly striking example, closure of heights
between Southern California and a point on the Northern California coast
will yield an error of about 5 feet.

When you start thinking about gravity-referenced methods, one should
think that the undulating geoid surface is pretty much where "mean sea
level" would appear if it were a perfect world instead of tidal
influences associated with lunar and solid earth tides, mass
concentrations, and magnetic anomalies, all of which will start to
affect some measurements.

With good geoid mapping, and an associated model of the theoretical
smooth earth surface rotating about the center of mass of the planet
(the ellipsoid), one can calculate the delta between the ellipsoid and
the geoid, or, the seperation. The algebraic ssum of height above the

ellipsoid and the seperation yields the geodetic height, approximating
"altitude."

None of this explanation has, however, talked about the benefit of
having adequate satellite geometry for point-positioning in three
dimensions. For horizontal positioning, one may have satellites
situated all about the sky, at various elevations above the horizon. As
only four satellites are required for a 3D autonomous fix, and as one
may have as many as 13 satellites visible in your sky (personal
observation, exactly ONCE!), one may suggest that the receiver evaluate
a number of satellite combinations and report a mean of the best, only
the best (based on geometry) or some variation thereof.

HOWEVER, the geometry is virtually never as good for trilateration with
respect to vertical determination. It's real hard to get signals
through the ground, and you'd really like at least one satellite
positioned directly below you, and perhaps one or two more at angles
below your horizon, to improve the geometry for determining height.
Since we don't get this very often, we must muddle through with the
constellation visible to us in the sky above. And, while I'm at it,
satellites on the horizon are usually excluded because their signals
must traverse the largest portion of the ionosphere and troposphere, and
thus are subject to a number of changes due to refraction by water
vapor, scintillation by charged particles, and are more prone to
contribute to multipath interference.

When we do serious geodetic height work, we utilize double-difference
solutions where one GPS receiver is set up over a geodetic benchmark
while the other is performing observables measurements on the point of
interest. Two receivers both recover a single satellite's observables
data at a common observation epoch. By collecting sufficient data to
achieve a statistical solution of the double difference data, one can
estimate the range and bearing between the two receivers. By collecting
further data at other sites, usually all control sites, one may
construct a geometric network of control sites, or constrained fiducial
sites, and use the method of least squares to ascertain a
network-adjusted floating position of the point of interest. If
sufficiently accurate benchmark sites were used, and if the measurement
plan conforms to good standards, one can safely estimate the degree of
error associated with the measurements. Done carefully, and in the time
consuming manner required for meticulous care, one can achieve
reproducible accuracies of 2-3 cm vertical... and 1-1.5 cm horizontal.

Oh... did I mention that dual frequency GPS receivers with particularly
stable characteristics are mandatory? No Garmin or Motorola OEM
receivers these, we're talking Ashtech Z-XII, Trimble 4000, 4700, 4800,
Javad, etc.

Questions?

73, gerry

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] Re: GPS Engines with WAAS

From: "Darryl Smith" <Darryl@radio-active.net.au>
Date: Tue, 18 Sep 2001 19:41:53 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36863-2001.09.18-05.08.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi All...

I am sure that we are all deeply sadened over the activities on 11
September in the USA.   In this case it was trained pilots, but could
just have easally been jets on some type of autopilot .This attack is
the type of attack that GPS Selective Availability was designed to
protect against.

The http://www.cryptome.org site has some interesting links. Importantly
http://www.theregister.co.uk/content/57/21709.html questions how the USA
air space was closed. Was the airspace closed with Security Control of
Air Traffic and Air Navigation Aids (SCATANA) where all navigational
aids (including VOR (VHF Omnirange), VORTAC (VHF Omnirange/Tactical Air
Navigation), TACAN (Tactical Air Navigation), LORAN (LOng RAnge
Navigation) and GPS (Global Positioning System)) were turned off, or was
it something else, such as Emergency Security Control of Air Traffic

(ESCAT).

For the first, an Air Defense Emergency is aparently required. With such
unprecidented damage, if an Air Defence Emergency was not declared, why
not. If it was, why wasn't GPS and the other technology deactivated, or
made less reliable? There are intersting implications here.

Darryl

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] Re: GPS Engines with WAAS

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 18 Sep 2001 12:26:09 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-36896-2001.09.18-07.47.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Darryl Smith wrote:
>
> Hi All...
>
> I am sure that we are all deeply sadened over the activities on 11
> September in the USA.   In this case it was trained pilots, but could
> just have easally been jets on some type of autopilot .This attack is
> the type of attack that GPS Selective Availability was designed to
> protect against.

Not really. Considering the 95m dither associated with SA, I believe it
was designed to prevent strikes against hardened military sites.

> The http://www.cryptome.org site has some interesting links. Importantly
> http://www.theregister.co.uk/content/57/21709.html questions how the USA
> air space was closed. Was the airspace closed with Security Control of
> Air Traffic and Air Navigation Aids (SCATANA) where all navigational
> aids (including VOR (VHF Omnirange), VORTAC (VHF Omnirange/Tactical Air
> Navigation), TACAN (Tactical Air Navigation), LORAN (LOng RAnge
> Navigation) and GPS (Global Positioning System)) were turned off, or was
> it something else, such as Emergency Security Control of Air Traffic
> (ESCAT).

ESCAT, at least here in Texas. The local navaids were still functional.

> For the first, an Air Defense Emergency is aparently required. With such
> unprecidented damage, if an Air Defence Emergency was not declared, why
> not. If it was, why wasn't GPS and the other technology deactivated, or
> made less reliable? There are intersting implications here.

It was. But shutting down all the navaids in this country isn't quite
as automatic as one might think. The combat air patorls had sufficient
challenge orders and rules of engagement to deal with new threats.

73, gerry

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

30. [tacgps] Digital Communications Conference -- Final Update

From: "John R. Ackermann" <jra@febo.com>
Date: Tue, 18 Sep 2001 19:32:34 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37021-2001.09.18-18.59.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Well, the Digital Communications Conference is only a few days away. If
you can make your way to Cincinnati, Ohio this weekend (Sept. 21-22) we
invite you to attend the show -- registration is available at the door.
Full details, including the current schedule, are available at
http://www.tapr.org/dcc.

Here's a brief rundown; note that due to the tragic events of last week,
we've had to make some adjustments to the schedule.

Friday:

Registration Opens	9:00AM	
APRS Forum		1:00 - 6:00PM (The morning part of the Forum has been cancelled.)
PRUG Social		7:00PM (Come enjoy the hospitality and see the latest activities of the Packet Radio Users Group of Tokyo, Japan.)

Saturday:

Registration Opens	7:15AM	
Main Program	8:00AM - 5:00PM	(There will be a mix of introductory sessions on new aspects of digital communication, as well as more advanced topics. We think there'll be something for everyone.)
TAPR Membership Meeting	5:00PM	
Banquet		7:00PM (Anthony Curtis, K3RXK will speak on "40 Years of Amateur Radio in Space.")

NOTE: We've regretfully had to cancel the Sunday Seminar. If you
registered for it, please stop at the registration area or contact TAPR to
arrange a refund.

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] Re: GPS Engines with WAAS

From: "Jeff King" <jeff@aerodata.net>
Date: Tue, 18 Sep 2001 21:16:25
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37081-2001.09.18-21.40.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brad Wiseman from Garmin just told me the GPS-16 started shipping
yesterday. They
are the WAAS version of the GPS-35, a OEM embedded board + antenna.

-Jeff wb8wka

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

32. [tacgps] Setting on local network

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Thu, 20 Sep 2001 17:42:08 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37677-2001.09.21-19.37.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Is there some software "out there" that will update the time on a machine
on a local ethernet from another machine on the net?

I have four PCs on my local ethernet (all running Win98) with one set to
gps time (running TAC32). It would be useful to have the machines update
their time periodically from the one with "good" time.

Seems like there was a brief thread on this some time ago, but I can't
locate it.

Regards,

Don, W4DH

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: Setting on local network

From: "Jim King" <jim@jimking.net>
Date: Fri, 21 Sep 2001 19:17:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37678-2001.09.21-19.41.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This might work: http://www.kaska.demon.co.uk/tardis.htm

Jim, KD5LUQ

----- Original Message -----
From: "Donald E Haselwood" <dhaselwood@ij.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, September 20, 2001 4:42 PM
Subject: [tacgps] Setting on local network

> Is there some software "out there" that will update the time on a machine
> on a local ethernet from another machine on the net?
>
> I have four PCs on my local ethernet (all running Win98) with one set to
> gps time (running TAC32). It would be useful to have the machines update
> their time periodically from the one with "good" time.
>
> Seems like there was a brief thread on this some time ago, but I can't
> locate it.
>
> Regards,
>
> Don, W4DH
>
>
>
> ---
> You are currently subscribed to tacgps as: jim@jimking.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

34. [tacgps] Re: Setting on local network

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 21 Sep 2001 18:13:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37696-2001.09.21-20.37.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I use timelord v2.5.0.60 attached link is to a more recent version
they ask for $10.

http://www.ossystems.co.uk/os_syst/time_lord.html

good luck,
Dan - w6lsn

Donald E Haselwood wrote:
>
> Is there some software "out there" that will update the time on a machine
> on a local ethernet from another machine on the net?
>
> I have four PCs on my local ethernet (all running Win98) with one set to
> gps time (running TAC32). It would be useful to have the machines update
> their time periodically from the one with "good" time.
>
> Seems like there was a brief thread on this some time ago, but I can't
> locate it.
>
> Regards,
>

> Don, W4DH
>
> ---
> You are currently subscribed to tacgps as: DAN.HINZ@IEEE.ORG
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

35. [tacgps] RE: Setting on local network

From: "Rick Hambly \(W2GPS\)" <w2gps@cnssys.com>
Date: Fri, 21 Sep 2001 22:05:51 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37702-2001.09.21-21.30.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Don,

Tac32Plus as a server coupled with a free NTP client like Dimension4
will do what you want.

http://www.cnssys.com/cnsclock/Tac32PlusSoftware.html
http://www.thinkman.com/dimension4/

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of Donald E
Haselwood
Sent: Thursday, September 20, 2001 5:42 PM
To: TAPR Special Interest Group
Subject: [tacgps] Setting on local network

Is there some software "out there" that will update the time on a
machine on a local ethernet from another machine on the net?

I have four PCs on my local ethernet (all running Win98) with one set to
gps time (running TAC32). It would be useful to have the machines
update their time periodically from the one with "good" time.

Seems like there was a brief thread on this some time ago, but I can't
locate it.

Regards,

Don, W4DH

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---
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36. [tacgps] RE: Setting on local network

From: "Robert E. Martinson" <REMartinson@RCN.com>
Date: Fri, 21 Sep 2001 22:29:53 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: <dhaselwood@ij.net>
Message-ID: <LYR6754-37707-2001.09.21-21.54.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This works great for me, its a copy of what i sent friend of mine a month or
2 ago:

Here from the PCMag web site:

QUOTE

Windows 98

 June 15, 2001 Synchronize System Clocks
Rate it Yourself
<http://www.pcmag.com/review_article/0,3011,s%253D1515%2526a%253D4028,00.asp
>

If you have several PCs connected to your network, keeping the time
synchronized between all of them is a snap. Designate one system to be the
timekeeper. On the others, create a shortcut in the \Windows\StartUp folder
with the command line C:\WINDOWS\NET.EXETIME\\MAIN/SET/YES, in which MAIN is
the network name of the system that keeps the time

UNQUOTE

It's close but WRONG punctuation: My main PC (a Pentium 500) has a network
name of "Pent500", as u know u need the "\\" before it. This line works GR8
for me: "C:\WINDOWS\NET.exe TIME \\Pent500 /SET /YES" . The spaces etc are
very important.

By the way my Pent500 is kept on VERY accurate time by a WWVB (60 KHz) clock
which syncs itself most every night, it has a disciplined oscillator so even
if it misses a night (because the PC is on, monitor causes RF interference)
it is still very accurate. In my startup routine the PC grabs the time from
it (via RS-232). I could have it update itself every xx minutes, but that
sounds a little unnecessary.

REM

-----Original Message-----
From: bounce-tacgps-19955@lists.tapr.org
[mailto:bounce-tacgps-19955@lists.tapr.org]On Behalf Of Donald E
Haselwood
Sent: Thursday, September 20, 2001 17:42 PM
To: TAPR Special Interest Group
Subject: [tacgps] Setting on local network

Is there some software "out there" that will update the time on a machine
on a local ethernet from another machine on the net?

I have four PCs on my local ethernet (all running Win98) with one set to
gps time (running TAC32). It would be useful to have the machines update
their time periodically from the one with "good" time.

Seems like there was a brief thread on this some time ago, but I can't
locate it.

Regards,

Don, W4DH

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---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] Re: Setting on local network

From: David Kelly <dkelly@grumpy.dyndns.org>
Date: Fri, 21 Sep 2001 22:48:07 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37716-2001.09.21-23.12.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Donald E Haselwood writes:
> Is there some software "out there" that will update the time on a machine
> on a local ethernet from another machine on the net?

Is built-in to MacOS 9 and up. FreeBSD too. Am told the latest from MS
finally includes this feature. And others have already pointed out
several implementations of NTP (Network Time Protocol) but have skipped
the mother site of all NTP information: http://www.eecis.udel.edu/~ntp/

--
David Kelly N4HHE, dkelly@hiwaay.net
===
The human mind ordinarily operates at only ten percent of its
capacity -- the rest is overhead for the operating system.

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38. [tacgps] RE: Setting on local network

From: "Dr. Tom Clark" <tac@clark.net>
Date: Sat, 22 Sep 2001 00:01:47 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37719-2001.09.21-23.26.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The client software I use with all Windoze platforms is Socket Watch
(SWATCH) available from
  http://www.locutuscodeware.com
which is shareware with a $10 license fee.

On the NTP server side, I note Rick's TAC32Plus "pro" version of TAC32:
  http://www.cnssys.com/cnsclock/Tac32PlusSoftware.html

If somebody wants the IP address of a TAC32+ NTP server, let me know.

73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

39. [tacgps] RE: Setting on local network

From: "W. D." <WD@US-Webmasters.com>
Date: Fri, 21 Sep 2001 23:02:18 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: REMartinson@RCN.com
Message-ID: <LYR6754-37720-2001.09.21-23.27.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 22:29 9/21/2001 -0400, Robert E. Martinson, wrote:
>By the way my Pent500 is kept on VERY accurate time by a WWVB (60 KHz) clock
>which syncs itself most every night, it has a disciplined oscillator so even
>if it misses a night (because the PC is on, monitor causes RF interference)
>it is still very accurate. In my startup routine the PC grabs the time from
>it (via RS-232). I could have it update itself every xx minutes, but that
>sounds a little unnecessary.

Hi Robert,

Could you please elaborate on this a bit? I am putting together
a Novell Netware 4.11 network. I want to be able sync up all
workstations with a time server. What is your 'disciplined
oscillator'? What kind of 60 KHZ receiver do you use? What
other parts are needed for the whole system? What software?
Where can I buy?

Thanks!

W. D.

Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

40. [tacgps] Re: Setting on local network

From: Bob Smallwood <smallwood@technologist.com>
Date: Sat, 22 Sep 2001 00:52:58 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37737-2001.09.22-00.17.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rather than push a specific product, here is the 'guru' page with links for
many programs. Which one you choose will depend on your platform, your
Internet connection speed, your internal connection speed, and the accuracy
required for each update. The web site has a wealth of information!!!
http://www.eecis.udel.edu/~ntp/

Many of them will take a GPS input on a serial port and serve the set time
up to other computers on the network. The other computers can request the
time whenever they wish.

I'm working to synchronize computers doing data acquisition tasks in my
company.

My question... does anybody know of one of these programs that LOGS the
changes in system time when it makes an adjustment?

  Bob Smallwood, N3FM

At 05:42 PM 9/20/01, you wrote:
>Is there some software "out there" that will update the time on a machine
>on a local ethernet from another machine on the net?
>
>I have four PCs on my local ethernet (all running Win98) with one set to
>gps time (running TAC32). It would be useful to have the machines update
>their time periodically from the one with "good" time.
>
>Seems like there was a brief thread on this some time ago, but I can't
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>
>Regards,
>
>Don, W4DH
>
>
>
>---
>You are currently subscribed to tacgps as: smallwood@technologist.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

41. [tacgps] Re: Setting on local network

From: "W. D." <WD@US-Webmasters.com>
Date: Sat, 22 Sep 2001 00:17:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37738-2001.09.22-00.42.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 00:52 9/22/2001 -0400, Bob Smallwood, wrote:
>My question... does anybody know of one of these programs that LOGS the
>changes in system time when it makes an adjustment?

http://www.RighTime.com/pub/rightime.txt

Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm

---
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42. [tacgps] Re: Setting on local network

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 21 Sep 2001 22:27:50 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37741-2001.09.22-00.52.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob- TimeLord see page
http://www.ossystems.co.uk/os_syst/time_lord.html

Bob Smallwood wrote:
.....
> My question... does anybody know of one of these programs that LOGS the
> changes in system time when it makes an adjustment?

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43. [tacgps] Resealning a GPS12?

From: "Darryl Smith" <Darryl@radio-active.net.au>
Date: Sat, 22 Sep 2001 16:13:38 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37743-2001.09.22-01.40.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi There...

The sealing of the two halves of my Garmin GPS12 has come off, and now
the internal workings are exposed... Has anyone had any experience with
resealing these units? I will also take some photos before I seal it
back up

Darryl

Darryl Smith, VK2TDS POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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44. [tacgps] Re: Resealning a GPS12?

From: Dave Martindale <davem@cs.ubc.ca>
Date: Fri, 21 Sep 2001 23:52:57 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37744-2001.09.22-02.16.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>The sealing of the two halves of my Garmin GPS12 has come off, and now
>the internal workings are exposed... Has anyone had any experience with
>resealing these units? I will also take some photos before I seal it
>back up

I haven't cracked open a GPS 12, but I have opened welded-shut battery packs
and "wall wart" transformers and similar devices. The GPS 12 case probably
behaves in the same way when opened.

I'd suggest using some "one hour" (slow setting) epoxy to seal it. When a
welded plastic case is cracked open, the plastic always seems to distort
somewhat and it never quite fits perfectly back together. Epoxy will fill
gaps and give a strong seam even when the fit isn't perfect. Carefully
apply a thin bead of epoxy all along the seam on one half of the case, or
preferably both halves, making sure the seam area gets wetted all along. Yet
don't use too much - you don't want it squeezing out so much that it impairs
some of the innards of the unit. Also, don't use "5 minute" epoxy - it just
won't give you enough time to mix it thoroughly and then apply it carefully.

Once the unit is back together, clamp the joint with elastic bands for at
least an hour or two. And don't apply any significant stress to the joint
for 24 hours - the epoxy takes that long to reach most of its strength.

Don't use cyanoacrylate glue; it depends on a good fit between parts.
Silicone might work, but in my experience isn't as strong. Urethane might
work, but tends to bubble up in gaps and the bubbled areas aren't strong.
Epoxy is what I know works.

Also, just before putting the two halves of the shell together for the last
time, you may want to squirt some "canned air" into the interior of the
case. This isn't really air, it's R134 refrigerant gas (these days, used to
be R12 or R22 in the past), but it's very very dry, and it will displace
moisture-laden room air and minimize chances of the unit fogging up inside
when it's cold. Dry nitrogen or argon or something like that would work too,

but the ubiquitous "dust gun" can is the easiest way I know to obtain dry gas.

Dave

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45. [tacgps] TAC-based NTP servers on the net

From: "Dr. Tom Clark" <tac@clark.net>
Date: Sat, 22 Sep 2001 16:10:10 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37832-2001.09.22-15.34.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Since a couple of people did ask, here are the TCP/IP addresses of TAC-based
NTP servers on the net located in the Balto/Wash area:

63.109.144.58 = is a "noname" Win2K machine at http://SyntonicsCorp.com in
Columbia
   MD running "beta" code for a new version of TAC32+ on a 1 GHz machine
running
   Win2K and equipped with a Motorola ONCORE VP v10.0 receiver

192.225.79.116 = tac.ggao.nasa.gov in Greenbelt, MD is a TAC32+ host running
   Win2K with an ONCORE VP v8.8

192.168.79.101 = godz.ggao.nasa.gov in Greenbelt, MD is a TAC32+ host
running
   Win2K with an ONCORE VP v10.0

192.225.79.100 = tomcat.ggao.nasa.gov in Greenbelt MD is a TAC32+ host
running
   in Win2K on a prototype SiRF-based timing receiver (some details of this
   instrument can be seen on http://www.gpstime.com)

162.33.148.98 = www.cnssys.com = www.gpstime.com is a LINUX xntpd host at
   Rick, W2GPS's QTH in Severna Park, MD running with an ONCORE VP v10.0

Of these Balto/Wash hosts, the GGAO machines all have pretty direct T3
internet connectivity.
Rick has a DSL connections and Syntonics has fractional T1. I believe that
Rick has a TAC32+/WINNT box online at cnssys, but he has recently changed
DSL services and I don't have the addresses here.

Also in the Boston/Nashua (more specifically Groton/Tyngsboro/Westford)
area, try 192.52.63.160 = tac.haystack.mit.edu at the Westford telescope of
the MIT Haystack Observatory. This is a Win98 machine running TAC32+ with a
ONCORE 8.8.

In Fairbanks, Alaska, try 192.70.244.3 = frostbite.gcgo.nasa.gov which has
hardware similar to Haystack/Westford.

73, Tom

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46. [tacgps] RE: Setting on local network

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Sat, 22 Sep 2001 20:16:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-37885-2001.09.22-19.49.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for all the responses and suggestions. I'm sorting through them.
(TAC32Plus looks great, but a little pricey for my budget ($250), but some
of the other ideas should do just fine.)

73's,
Don, W4DH

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47. [tacgps] RE: Setting on local network

From: Bob Smith <bobsmith@i2020.net>
Date: Sun, 23 Sep 2001 10:49:02 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-38007-2001.09.23-10.14.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Donald --

It seems to me that two components are needed;

1. A NTP time "server", and

2. A series of NTP clients for the satellite machines.

TAC32Plus at $250 is a bit pricey.

Another approach might be to try the JNOS TCP/IP package. It contains
both time servers and clients for maintaining network synchronization.

You would then run one copy of TAC32 to maintain the system clock on
your "server" system and a copy of JNOS in each system, one configured
as the time "server" and the other configured as clients.

You could also simply run 4DTIME one each system and synchronize to the
Naval Observatory.

        Bob Smith, WA4YPV

Donald E Haselwood wrote:
>
> Thanks for all the responses and suggestions. I'm sorting through them.
> (TAC32Plus looks great, but a little pricey for my budget ($250), but some
> of the other ideas should do just fine.)
>
> 73's,
> Don, W4DH
>
> ---
> You are currently subscribed to tacgps as: bobsmith@i2020.net
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--

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48. [tacgps] Re: GPS Engines with WAAS

From: "R. Wittner" <rmw@rwa-inc.com>
Date: Tue, 25 Sep 2001 10:39:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-38395-2001.09.25-10.04.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jeff,

Is there any more info about the '16? I can't seem to find it on Garmin's
site - though I admit I didn't dig very much.

Thanks,

   -Rob
    KZ5RW

-----Original Message-----
From: bounce-tacgps-18051@lists.tapr.org
[mailto:bounce-tacgps-18051@lists.tapr.org]On Behalf Of Jeff King
Sent: Tuesday, September 18, 2001 9:16 PM
To: TAPR Special Interest Group
Subject: [tacgps] Re: GPS Engines with WAAS

Brad Wiseman from Garmin just told me the GPS-16 started shipping
yesterday. They
are the WAAS version of the GPS-35, a OEM embedded board + antenna.

-Jeff wb8wka

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---
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49. [tacgps] Re: GPS Engines with WAAS

From: "Jeff King" <transit_man@hotmail.com>
Date: Tue, 25 Sep 2001 15:31:02 +0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-38416-2001.09.25-10.55.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

It is not on the garmin site. For some reason they were only faxing the info
to their OEM customers. Here is a clip from an e-mail garmin sent me on it
about two weeks ago, I also just queried them about a electronic brochure on
it today. It is a good bet they are using the
same engine as the GPS-17N, which is on their site now.

Jeff,
The WAAS enabled units, GPS16-LVS and GPS16-HVS, went into production on
Monday (9/10). It depends on our shipping constraints at this point as to
when we will have them available. I fear that they will be shipped by boat
which means it will be 5 or 6 weeks before they arrive here. Hopefully, we
will wait and ship them by air transport when those routes become available
early next week. That would mean that the units would become available late
the week of the 24th. I'm trying to get pricing on the units today, but
have been unable to meet with management on this issue. I think they will
be slightly more expensive than the corresponding versions of the GPS35.

_____
Get your FREE download of MSN Explorer at http://explorer.msn.com/intl.asp

---
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50. [tacgps] Re: GPS Engines with WAAS

From: "R. Wittner" <rmw@rwa-inc.com>
Date: Tue, 25 Sep 2001 11:52:51 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-38422-2001.09.25-11.17.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

OK, thanks for the info! I did see the 17 on their site. I'd like to get
my hands on one of these when they start shipping.

-Rob

-----Original Message-----
From: bounce-tacgps-18051@lists.tapr.org
[mailto:bounce-tacgps-18051@lists.tapr.org]On Behalf Of Jeff King
Sent: Tuesday, September 25, 2001 11:31 AM
To: TAPR Special Interest Group

Subject: [tacgps] Re: GPS Engines with WAAS

It is not on the garmin site. For some reason they were only faxing the info
to their OEM customers. Here is a clip from an e-mail garmin sent me on it
about two weeks ago, I also just queried them about a electronic brochure on
it today. It is a good bet they are using the
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the week of the 24th. I'm trying to get pricing on the units today, but
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be slightly more expensive than the corresponding versions of the GPS35.

_____
Get your FREE download of MSN Explorer at http://explorer.msn.com/intl.asp

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51. [tacgps] GPS Map 76

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Fri, 28 Sep 2001 02:05:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39045-2001.09.28-02.31.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

While on vacation, I bought a Garmin GPS Map 76.

I noted a problem if you use a Garmin GA27 antenna - it does not
appear to have enough gain, compared to the internal helix antenna to
receive the WAAS signal.

I attempted to use one of the Motorola Oncore antennas, but either
it does not pulle enough current or it pulls too much - It did not work.

In Northern Alabama the WAAS satellite appears to be at a 45 degree
elevation. With the internal helix antenna, the WAAS bird shows about 2 to
3 bars of signal strength. With the GA27, it shows 1 bar of signal
strength.

Other than the above problems, I like the unit...

52. [tacgps] Re: GPS Map 76

From: Dave Martindale <davem@cs.ubc.ca>
Date: Fri, 28 Sep 2001 00:32:11 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39046-2001.09.28-02.55.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I attempted to use one of the Motorola Oncore antennas, but either it does
>not pulle enough current or it pulls too much - It did not work.
What voltage does the Garmin 76 provide on the external antenna jack? Most
new Garmins use 3V logic internally, and provide only 2-3 V at the antenna
connector. Most older antennas (including the GA-27, and probably including
the Oncore) expect 5 V power, and work poorly or not at all at 2.5 V. If
the GPS 76 uses 2 AA cells instead of 4, it's almost certainly a low-voltage
design, and these older antennas are not suitable.

Garmin has revised their antennas to work over a wider voltage range; the

new version with the MCX connector is called the GA-27C (note the "C"
suffix). The Tri-M "Mighty Mouse II" and "Micro Mouse" are also designed
for the lower voltage, as is the antenna sold by SiGem. Any of them should
provide good signal strength down to 2.5 V in, possibly even lower.

         Dave

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53. [tacgps] Re: GPS Map 76

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Fri, 28 Sep 2001 02:42:30 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39047-2001.09.28-03.08.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

You have hit it on the head. It uses 2 "AA" cells.

Just what I need...to buy another external antenna !

> ----------
> From: Dave Martindale[SMTP:davem@cs.ubc.ca]
> Reply To: TAPR Special Interest Group
> Sent: Friday, September 28, 2001 2:32 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: GPS Map 76
>
>
> >I attempted to use one of the Motorola Oncore antennas, but either it
> does
> >not pulle enough current or it pulls too much - It did not work.
> What voltage does the Garmin 76 provide on the external antenna jack?
> Most
> new Garmins use 3V logic internally, and provide only 2-3 V at the antenna
> connector. Most older antennas (including the GA-27, and probably
> including
> the Oncore) expect 5 V power, and work poorly or not at all at 2.5 V. If
> the GPS 76 uses 2 AA cells instead of 4, it's almost certainly a
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> design, and these older antennas are not suitable.
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> new version with the MCX connector is called the GA-27C (note the "C"
> suffix). The Tri-M "Mighty Mouse II" and "Micro Mouse" are also designed
> for the lower voltage, as is the antenna sold by SiGem. Any of them
> should
> provide good signal strength down to 2.5 V in, possibly even lower.
>
>   Dave
>
>
> ---
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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

54. [tacgps] Re: GPS Map 76

From: randy@synergy-gps.com
Date: Fri, 28 Sep 2001 08:51:51 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39093-2001.09.28-11.16.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thought I'd chip in here with my two cents worth.

As Dave alluded to, the Oncore antenna probably is drawing too
much current. I'm not sure which Oncore antenna he was referring
to,
but both the Antenna97 and old Motorola hockey puck run in the
25+ mA
range. The Antenna97 actually does work quite well at 3V, but the
current is still rather high compared to newer units, and it is
probably more current than the Garmin cares to supply.

My current low voltage, low power favorite is what we call the SMK-
4

(I think it's basically the same antenna as the Micro-Mouse). This
unit (and most newer active antennas) are typically specified over a
range of 2.5-5.5V, and draw much less current than previous
designs. I
think the SMK-4 pulls about 6-8mA at 3V.

Randy Warner
Senior Applications Engineer
Synergy Systems, LLC

---------- Original Message ----------

>
>
> While on vacation, I bought a Garmin GPS Map 76.
>
> I noted a problem if you use a Garmin GA27 antenna - it does not
> appear to have enough gain, compared to the internal helix antenna
> to receive the WAAS signal.
>
> I attempted to use one of the Motorola Oncore antennas, but either
> it
> does not pulle enough current or it pulls too much - It did not
> work.
>
> In Northern Alabama the WAAS satellite appears to be at a 45 degree
> elevation. With the internal helix antenna, the WAAS bird shows
> about 2 to 3 bars of signal strength. With the GA27, it shows 1 bar
> of signal strength.
>

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  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
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55. [tacgps] Re: GPS Map 76

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Sat, 29 Sep 2001 00:09:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39198-2001.09.29-00.35.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

It was the antenna97. It did not work at all. The Garmin GA27 did work,
but the gain was too low. The GPSMap76 uses two "AA" cells for power and I
suspect the antenna "switch" goes thru some type of semiconductor switch -
dropping 0.7 volts, so the antenna port is probably fed about 2.3 volts or
lower.

I reckon its the price you pay for new technology - you have to get new toys
to go with it !

> ----------
> From: randy@synergy-gps.com[SMTP:randy@synergy-gps.com]
> Reply To: TAPR Special Interest Group
> Sent: Friday, September 28, 2001 10:51 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: GPS Map 76
>
>
> Thought I'd chip in here with my two cents worth.
>
> As Dave alluded to, the Oncore antenna probably is drawing too
> much current. I'm not sure which Oncore antenna he was referring
> to,
> but both the Antenna97 and old Motorola hockey puck run in the
> 25+ mA
> range. The Antenna97 actually does work quite well at 3V, but the
> current is still rather high compared to newer units, and it is
> probably more current than the Garmin cares to supply.
>
> My current low voltage, low power favorite is what we call the SMK-
> 4
> (I think it's basically the same antenna as the Micro-Mouse). This

> unit (and most newer active antennas) are typically specified over a
> range of 2.5-5.5V, and draw much less current than previous
> designs. I
> think the SMK-4 pulls about 6-8mA at 3V.
>
> Randy Warner
> Senior Applications Engineer
> Synergy Systems, LLC
>
> --------------- Original Message -----------------
>
> >
> >
> > While on vacation, I bought a Garmin GPS Map 76.
> >
> > I noted a problem if you use a Garmin GA27 antenna - it does not
> > appear to have enough gain, compared to the internal helix antenna
> > to receive the WAAS signal.
> >
> > I attempted to use one of the Motorola Oncore antennas, but either
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> > does not pull enough current or it pulls too much - It did not
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> > In Northern Alabama the WAAS satellite appears to be at a 45 degree
> > elevation. With the internal helix antenna, the WAAS bird shows
> > about 2 to 3 bars of signal strength. With the GA27, it shows 1 bar
> > of signal strength.
> >
>
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> Voice (858) 566-0666 Toll Free 888 479-6749
>   Fax (858) 566-0768 Web Site http://www.synergy-gps.com
> lat N 32.54' 43.9612 Lon W 117 06' 41.8060
> Motorola's leading ONCORE GPS Distributor in the Americas
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

56. [tacgps] Re: GPS Map 76

From: Dave Martindale <davem@cs.ubc.ca>
Date: Fri, 28 Sep 2001 22:51:18 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39205-2001.09.29-01.14.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>It was the antenna97. It did not work at all. The Garmin GA27 did work, but the gain was too low.
The GPSMap76 uses two "AA" cells for power and I suspect the antenna "switch" goes thru some type of
semiconductor switch - dropping 0.7 volts, so the antenna port is probably fed about 2.3 volts or lower.

People have measured the antenna jack supply voltage on the Garmin eMap
being as low as 1.9 V - it seems to droop along with battery voltage.

An antenna rated to meet all its specs at 2.5 V will probably still be doing
something useful at 1.9 V. But many 5 V antennas simply don't work at all
at that voltage.

        Dave

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

57. [tacgps] Re: Question from eBay Member

From: bobhome@pacbell.net
Date: Sat, 29 Sep 2001 08:16:19 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: tacgps@lists.tapr.org
Message-ID: <LYR6754-39271-2001.09.29-10.41.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi folks,

I was going to speak to the seller on these and see if I could wrangle a fixed price for those who might
 be interested... Unfortunately, I just noticed that they are posted on eBay so here's a heads up...

The Z3801 is a GPS disciplined frequency source designed for stand alone operation - provide power and an active GPS antenna as input, get 10 MHz and 1pps as output. I believe the firmware uses multiple time constants when locking so the initial coarse lock is very fast, over time, the time constants stretch out and the source quiets down nicely. Mine locked up to GPS in an hour or less with 10^-8 or so accuracy on the 10 MHz output. The output further stabilized over the next day. Note that the crystal in this unit is a double oven version of the HP 10811...

The Z3801A comes in two power supply voltage ranges. The one I bought from buylegacy is the higher voltage device, and requires at least 46VDC to start operation. These are designed to run with battery supplies in a cell site or the like and will maintain operation down to 38V if running off a depleated battery supply. This model will accept as much as 56VDC. I'm powering mine with a 48 VDC nominal switcher adjusted to 50VDC for a nice margin. Start current is around 700 mA as the oven heats, running current settles to about 400 mA once the oven is maintaining temp.

Finally, there is a PC Windows program originally provided by HP as an included accessory that monitors the device providing status and control functions. The serial port on the Z3801A is RS-422 and can be made to work on an RS-232 port with a simple wiring adapter and a 100 Ohm resistor. Links more than a few feet require an RS-232/RS-422 converter.

Here are a couple of suggestions for off the shelf solutions:

48V 1.6A switcher
Digikey part number: 62-1043-ND ($74.97/ea)
Volgen part number: SPN75-48S
http://www.volgen.com/datasheet/prd_SPN75.html

RS-232/RS-422 converter
I'm using an Aten IC485S: http://www.aten-usa.com/products/product.php?ITEM=IC485S
Check Pricegrabber for availability:
http://www.pricegrabber.com/search_getprod.php?masterid=339835&search=ic485s&ut=ceab21724094cbd7

Hope this helps... I'm completely happy with the device and seller - James at buylegacy/zrg.

Regards,
Bob

----- Original Message -----
From: <mmaseda@gte.net>
To: <bobhome@pacbell.net>
Sent: Friday, September 28, 2001 7:51 PM
Subject: Question from eBay Member

>
> To member: c310driver
> From member: mmaseda@gte.net
>
> --------------------
>
>
> Hi,
>
> Noticed you bought a HP Z3801A. I was wondering if you could tell me the voltage requirements? Also how does it work?
>
> Thanks,
>
> Manuel
>
>
> --------------------
> This email was sent by an eBay member via eBay's email forwarding system.
> If you reply to the email, your response will go directly to the member and
> not through eBay.
>
> eBay does not tolerate spam (i.e., unsolicited commercial email) and is
> taking steps to protect members from this abuse. In addition, solicitations
> to buy or sell items outside of eBay violate eBay rules and are not covered
> by services that protect members such as feedback, insurance, escrow, and
> dispute resolution. If this is an offer to buy/sell items outside of eBay,
> please do not participate. Enter the following link into your browser to learn more. Link:
http://pages.ebay.com/help/email_info.html
>
>
>

58. [tacgps] Re: Question from eBay Member

From: "Robert Leichner" <bobhome@pacbell.net>
Date: Sat, 29 Sep 2001 11:31:1
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39279-2001.09.29-11.55.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi folks,

I'm the poster of the message: "Re: Question from eBay Member".
Unfortunately, I had two email drafts open and sent the message to the list
a bit earlier than I'd intended. Subject is not helpful, and there was a
bit of editing yet to be done on content.

A buddy from work and had asked about posting items for sale to the list.
My post seemed consistant with the response that it was OK given reasonable
restraint. I just wanted to let you know that I am not the seller of the
Z3801A clocks, and have no relationship with the seller other than as a
customer for the clocks I bought. I believe the Z3801A is a superb clock,
and that it was worth letting the group know they are out there.

Again, my apologies for a less than ideal first posting to the list!

Many thanks,
Bob

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

59. [tacgps] Re: Question from eBay Member

From: "Robert Leichner" <bobhome@pacbell.net>
Date: Sat, 29 Sep 2001 14:45:34
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39309-2001.09.29-15.10.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

OK... I give up...

There were 6 separate Z3801A GPS sources posted on eBay this morning with
auctions concluding Monday. Now they are all gone. I assume the seller
pulled them for some reason. I have no idea what's going on, but no point
going to eBay to look for them!

Sorry for the wasted bandwidth.

Best wishes,
Bob

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

60. [tacgps] GPS-disciplined oscillators

From: Dave Martindale <davem@cs.ubc.ca>
Date: Sat, 29 Sep 2001 13:38:32 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39337-2001.09.29-17.46.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Another possible source for GPS-disciplined oscillators: Tri-M
(www.tri-m.com) has a number of surplus Trimble Thunderbolts for $495. Go
to their web page, do a search for "thunderbolt", and you should find
them. This has 10 MHz and 1 PPS outputs, with the 10 MHz phased-locked to
UTC and 1 PPS locked to the 10 MHz under normal operation. There are
configuration settings
that determine how the unit recovers from a loss of GPS signal.

The pricing page has two prices, about $1700 and $495. I suspect that the
first price is for the complete development kit, new. The $495 price says
"board only - no power supply" but I
suspect that what it really means is that you get the Thunderbolt metal
box, which contains both the GPS/oscillator card and a switching supply
that converts 24 VDC to +-12 and 5 V used internally. You do *not* get a
120VAC-24VDC supply, or the other bits of the development kit.

If anyone is interested, I imagine email to Tri-M would get more info. I
don't work for them; I just know about their stock of surplus Thunderbolts.

Dave

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

61. [tacgps] Re: Question from eBay Member

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Sat, 29 Sep 2001 12:53:46 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39339-2001.09.29-18.19.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the posting, Bob.

I picked up a couple of them on eBay this past month.
They are very nice and similar, I think, to the HP 58503.

I used a 48 VDC power supply from Jameco; P/N 172064
($49). See http://www.jameco.com/. Of course you could
homebrew your own supply.

I used a RS-422/RS-232 converter from B&B Electronics,
P/N 422PP9TB ($75). See http://www.bb-elec.com/. You
can homebrew your own by wiring one of the differential
lines to ground to simulate something that looks like
RS-232. Note the interface is 19200-7-Bits-Odd Parity
and I didn't see how to change it. Any old PC terminal
program will allow you to type SYST:STAT? and see
the full screen result.

If you want to mate with the special power connector
they are AMP Mate-N-Lok II connectors. I got mine from
Mouser, P/N 571-7700181 with pins 571-7702534.
See http://www.mouser.com/. But you can homebrew
this by opening the case and using aligator clips to
deliver 48 VDC directly to the power supply board.

The Z3801A appears to use the same interface as the
more well known HP 58503A/B GPS receivers. Besides
the obvious differences in industrial packaging, power
interface, and RS-422 levels, perhaps someone at HP
Agilent can comment on the difference, if any, between
the 58503 and the Z3801 firmware or specs.

I'm told these units are surplus from Sprint. I wonder
why they needed to get rid of them. The manufacture
date appears to be around 1995 or 1996. They are
WNRO and Y2K compliant as best I can tell.

The Z3801A uses a HP 10811-60161 oscillator which
appears to be a regular 10811 inside a larger thermal
can. I'm not sure if this is truly a double proportional
oven or if the outside oven is simply to allow the Z3801
to work when the ambient temperature is way down
below zero

/tvb
www.LeapSecond.com
  ----- Original Message -----
  From: bobhome@pacbell.net
  To: TAPR Special Interest Group
  Cc: tacgps@lists.tapr.org
  Sent: Saturday, September 29, 2001 08:16
  Subject: [tacgps] Re: Question from eBay Member

  Hi folks,

  I was going to speak to the seller on these and see if I could wrangle a fixed price for those who might be interested... Unfortunately, I just noticed that they are posted on eBay so here's a heads up...
  ...

62. [tacgps] Re:Z3801A

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Sat, 29 Sep 2001 10:58:08 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39344-2001.09.29-18.35.17--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the posting, Bob.

I picked up a couple of them on eBay this past month.
They are very nice and similar, I think, to the HP 58503.

I used a 48 VDC power supply from Jameco; P/N 172064
($49). See http://www.jameco.com/. Of course you could
homebrew your own supply.

I used a RS-422/RS-232 converter from B&B Electronics,
P/N 422PP9TB ($75). See http://www.bb-elec.com/. You
can homebrew your own by wiring one of the differential
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If you want to mate with the special power connector
they are AMP Mate-N-Lok II connectors. I got mine from
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See http://www.mouser.com/. But you can homebrew
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date appears to be around 1995 or 1996. They are
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appears to be a regular 10811 inside a larger thermal
can. I'm not sure if this is truly a double proportional
oven or if the outside oven is simply to allow the Z3801
to work when the ambient temperature is way down
below zero

/tvb
www.LeapSecond.com
  ----- Original Message -----
  From: bobhome@pacbell.net
  To: TAPR Special Interest Group
  Cc: tacgps@lists.tapr.org
  Sent: Saturday, September 29, 2001 08:16
  Subject: [tacgps] Re: Question from eBay Member

  Hi folks,

  I was going to speak to the seller on these and see if I could wrangle a fixed price for those who might be interested... Unfortunately, I just noticed that they are posted on eBay so here's a heads up...

  The Z3801 is a GPS disciplined frequency source designed for stand alone operation - provide power and an active GPS antenna as input, get 10 MHz and 1pps as output. I believe the firmware uses multiple time constants when locking so the initial coarse lock is very fast, over time, the time constants stretch out and the source quiets down nicely. Mine locked up to GPS in an hour or less with 10^-8 or so accuracy on the 10 MHz output. The output further stabilized over the next day. Note that the crystal in this unit is a double oven version of the HP 10811...

  The Z3801A comes in two power supply voltage ranges. The one I bought from buylegacy is the higher voltage device, and requires at least 46VDC to start operation. These are designed to run with battery supplies in a cell site or the like and will maintain operation down to 38V if running off a depleated battery supply. This model will accept as much as 56VDC. I'm powering mine with a 48 VDC nominal switcher adjusted to 50VDC for a nice margin. Start current is around 700 mA as the oven heats, running current settles to about 400 mA once the oven is maintaining temp.

Finally, there is a PC Windows program originally provided by HP as an included accessory that monitors the device providing status and control functions. The serial port on the Z3801A is RS-422 and can be made to work on an RS-232 port with a simple wiring adapter and a 100 Ohm resistor. Links more than a few feet require an RS-232/RS-422 converter.

Here are a couple of suggestions for off the shelf solutions:

48V 1.6A switcher
Digikey part number: 62-1043-ND ($74.97/ea)
Volgen part number: SPN75-48S
http://www.volgen.com/datasheet/prd_SPN75.html

RS-232/RS-422 converter
I'm using an Aten IC485S: http://www.aten-usa.com/products/product.php?ITEM=IC485S
Check Pricegrabber for availability:
http://www.pricegrabber.com/search_getprod.php?masterid=339835&search=ic485s&ut=ceab21724094cbd7

Hope this helps... I'm completely happy with the device and seller - James at buylegacy/zrg.

Regards,
Bob

63. [tacgps] Re:Z3801A

From: "Brooks Shera" <ebs@lanl.gov>
Date: Sat, 29 Sep 2001 17:39:04 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39350-2001.09.29-19.04.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I might guess that Sprint used these GPS standards to sync their cell sites to permit triangulation for locating E911 calls as required by the gov't. Sprint is one of several cell providers that is switching from triangulation to a GPS built into the cell phone to meet the location requirement. If this is so we might expect to see a lot of the Z3801s appearing. I wonder how many cell sites Sprint has? :-)

----- Original Message -----
From: Tom Van Baak
To: TAPR Special Interest Group
Sent: Saturday, September 29, 2001 11:58 AM
Subject: [tacgps] Re:Z3801A

Thanks for the posting, Bob.

I picked up a couple of them on eBay this past month.
They are very nice and similar, I think, to the HP 58503.

I used a 48 VDC power supply from Jameco; P/N 172064
($49). See http://www.jameco.com/. Of course you could
homebrew your own supply.

I used a RS-422/RS-232 converter from B&B Electronics,
P/N 422PP9TB ($75). See http://www.bb-elec.com/. You
can homebrew your own by wiring one of the differential
lines to ground to simulate something that looks like
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and I didn't see how to change it. Any old PC terminal
program will allow you to type SYST:STAT? and see
the full screen result.

If you want to mate with the special power connector
they are AMP Mate-N-Lok II connectors. I got mine from
Mouser, P/N 571-7700181 with pins 571-7702534.
See http://www.mouser.com/. But you can homebrew
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deliver 48 VDC directly to the power supply board.

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interface, and RS-422 levels, perhaps someone at HP
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the 58503 and the Z3801 firmware or specs.

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why they needed to get rid of them. The manufacture
date appears to be around 1995 or 1996. They are
WNRO and Y2K compliant as best I can tell.

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can. I'm not sure if this is truly a double proportional
oven or if the outside oven is simply to allow the Z3801
to work when the ambient temperature is way down
below zero

/tvb
www.LeapSecond.com
----- Original Message -----
From: bobhome@pacbell.net
To: TAPR Special Interest Group
Cc: tacgps@lists.tapr.org
Sent: Saturday, September 29, 2001 08:16
Subject: [tacgps] Re: Question from eBay Member

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I'm using an Aten IC485S: http://www.aten-usa.com/products/product.php?ITEM=IC485S
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Regards,
Bob

64. [tacgps] Re:Z3801A

From: bobhome@pacbell.net
Date: Sat, 29 Sep 2001 16:48:31 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39352-2001.09.29-19.13.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Isn't a GPS source required for frequency control? Holdover performance to maintain tolerance during GPS interruptions?

Guess I'd better sell my remaining Rb fast while there is still a market.

How about a phone call to discuss NM? What number are you at? What's a good time?

B

----- Original Message -----
From: Brooks Shera
To: TAPR Special Interest Group
Sent: Saturday, September 29, 2001 4:39 PM
Subject: [tacgps] Re:Z3801A

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To: TAPR Special Interest Group
Sent: Saturday, September 29, 2001 11:58 AM
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/tvb
www.LeapSecond.com

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Volgen part number: SPN75-48S
http://www.volgen.com/datasheet/prd_SPN75.html

RS-232/RS-422 converter
I'm using an Aten IC485S: http://www.aten-usa.com/products/product.php?ITEM=IC485S
Check Pricegrabber for availability:
http://www.pricegrabber.com/search_getprod.php?masterid=339835&search=ic485s&ut=ceab21724094cbd7

Hope this helps... I'm completely happy with the device and seller - James at buylegacy/zrg.

Regards,
Bob

65. [tacgps] Re:Z3801A

From: bobhome@pacbell.net
Date: Sat, 29 Sep 2001 16:53:34 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39353-2001.09.29-19.18.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Sigh... I thought I was responding direct to Brooks...

Not my day for email groups!

Bob

> ----- Original Message -----
> From: bobhome@pacbell.net
> To: TAPR Special Interest Group
> Sent: Saturday, September 29, 2001 4:48 PM
> Subject: [tacgps] Re:Z3801A
>
> Isn't a GPS source required for frequency control? Holdover performance to maintain tolerance during GPS interruptions?
>
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>
> How about a phone call to discuss NM? What number are you at? What's a good time?
>
> B

October 2001

Original source file: tacgps.0110
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0110

1. [tacgps] HP 10544A schematics ?

From: Marco Bruno <IK1ODO@libero.it>
Date: Tue, 02 Oct 2001 07:43:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39829-2001.10.02-07.43.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,

anyone there has the service manual or at least the schematics of the HP 10544A
OCXO?

It seems hard to find from the usual manual dealers.

Marco Bruno - IK1ODO - Italy

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: HP 10544A schematics ?

From: Dan Hinz <dan.hinz@ieee.org>
Date: Tue, 02 Oct 2001 20:03:52 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39978-2001.10.02-22.28.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I can provide a schematic for the HP 10811A/B. I believe it is very
similar to the 10544. The 10811 can be substituted for the 10544 in
HP's equipment.

Let me know if you would like them. I'll have to take them to work to
scan them on a flat bed scanner as they are still in the manual.
73,
Dan - W6LSN

Marco Bruno wrote:
>
> Hi all,
>
> anyone there has the service manual or at least the schematics of the HP 10544A
> OCXO?
>
> It seems hard to find from the usual manual dealers.
>
> Marco Bruno - IK1ODO - Italy
>
> ---
> You are currently subscribed to tacgps as: DAN.HINZ@IEEE.ORG
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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3. [tacgps] Efratom FRS Rb for sale w/ extras

From: bobhome@pacbell.net
Date: Tue, 02 Oct 2001 21:08:47 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-39983-2001.10.02-23.33.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi folks,

I have an Efratom FRS Rb source for sale. I'm including a 24 VDC / 2.5A Hitron switching supply with
OVP, an FRS manual, and a Minicircuits 18 MHz low pass filter that will convert the FRS TTL output into
a reasonable approximation of a sine wave. While I haven't been using the source, I did adjust it to
agree with a GPS disciplined source after an 18-hour warm-up.

I bought the FRS on eBay for $450 without the supply, and will sell the complete package for $375
delivered in the lower 48.

I've placed an image of the package at: http://home.pacbell.net/leichner/images/Rb_package.JPG

Many thanks,
Bob

4. [tacgps] Re: HP 10544A schematics ?

From: Gary Thurmond <w6str@mcn.org>
Date: Wed, 03 Oct 2001 09:56:34 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40055-2001.10.03-12.19.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tucker Electronics has 47 of the HP 10811 A/B manual for $10 ea. + shipping. The
10811 is similar to the 10544. The manual condition is described as used but mine
arrived in excellent condition.
It contains the Theory of Operation, Operation Verification, Troubleshooting and
Schematics.

http://www.planettest.com/scripts/osa/ViewPage.exe?templateName=item_form.htx&itemNumber=913127

Description:
H-P10811A/B QUARTZ CRYSTAL OSCILLATOR Operating/Service Manual

73'

Gary, w6str

Marco Bruno wrote:

> Hi all,
>
> anyone there has the service manual or at least the schematics of the HP 10544A
> OCXO?
>
> It seems hard to find from the usual manual dealers.
>
> Marco Bruno - IK1ODO - Italy
>
> ---
> You are currently subscribed to tacgps as: w6str@mcn.org
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Here's a method to force the Z3801A into UTC time mode

From: bobhome@pacbell.net
Date: Thu, 04 Oct 2001 14:36:22 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40285-2001.10.04-17.01.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Several of us have Z3801A GPS disciplined clocks that are displaying GPS time. The documentation is
unfortunately missing a command to convert time display to UTC mode. The :SYST:PRES command also fails
to make the conversion to UTC mode which was stated as the factory default.

The following is text from correspondence with a Symmetricom support engineer describing a means of
changing the reference. Please note that while the :syst:pon command included below was not recognized
by my Z3801A, an actual power cycle had the desired effect.

As a final note, would you please send me any information you may have on how/when your Z3801A went into
 GPS mode? I'll pass the information along to the support engineer who is trying to understand this
behavior.

Many thanks,
Bob

START FROM SYMMETRICOM
==

The GPS default configuration is to compute the time in UTC. It can be
switched to GPS time that as today is 13 seconds ahead. I don't understand
how the unit switched to GPS, it is done using an undocumented command. This
is the procedure to switch to back UTC time:

a) use the following command to confirm the unit is in UTC/GPS mode:

:diag:gps:utc?

if the response is 1 the unit is on UTC mode, if it is 0 the unit is in GPS
mode. If the unit is in UTC mode this will not solve the problem. If it is
on GPS mode the following command will switch it to UTC

:ptime:utc 1

after this (depending on the firmware level) the unit will reset by itself
and display/output the correct time, if the unit does not reset use the
following command to reset it.

:syst:pon

NOTE: some older models do not accept the :ptime:utc command, in that case
use the alternate way: (this will work also on the newer units)

:diag:gps:utc 1

after this (depending on the firmware level) the unit will reset by itself
and display the correct time, if the unit does not reset use the following
command to reset it.

:syst:pon   <I had to power cycle my older firmware Z3801A at this point. :syst:pon was not recognized.>

---

the unit should be on UTC now.

END FROM SYMMETRICOM ==========

6. [tacgps] RE: Here's a method to force the Z3801A into UTC time mode

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Thu, 4 Oct 2001 21:33:02 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40352-2001.10.04-20.58.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello, All!

For those of us who were about to bid on a Z3801A when they were 'pulled'
from EBay...

Does anyone know of another source besides buylegacy.com, at a similar price
to the $399 starting price for the EBay auctions? I note that the Z3801A's
that sold did not sell at prices far from the opening bids.

The Trimble Thunderbolt as sold by Tri-M seems to be a reasonably priced
alternative. But I suspect it may not be as stable in actual use.

I have also not seen any HP 58503's on EBay lately. Any sources known with
prices in the $400 range?

Thanks in advance...
  -----Original Message-----
  From: bounce-tacgps-23685@lists.tapr.org
[mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of bobhome@pacbell.net
  Sent: Thursday, October 04, 2001 5:36 PM
  To: TAPR Special Interest Group
  Subject: [tacgps] Here's a method to force the Z3801A into UTC time mode

  Several of us have Z3801A GPS disciplined clocks that are displaying GPS
time. The documentation is unfortunately missing a command to convert time
display to UTC mode. The :SYST:PRES command also fails to make the
conversion to UTC mode which was stated as the factory default.

  The following is text from correspondence with a Symmetricom support
engineer describing a means of changing the reference. Please note that
while the :syst:pon command included below was not recognized by my Z3801A,
an actual power cycle had the desired effect.

```
  As a final note, would you please send me any information you may have on
how/when your Z3801A went into GPS mode? I'll pass the information along to
the support engineer who is trying to understand this behavior.

  Many thanks,
  Bob

  START FROM SYMMETRICOM
  ======================================================

  The GPS default configuration is to compute the time in UTC. It can be
  switched to GPS time that as today is 13 seconds ahead. I don't understand
  how the unit switched to GPS, it is done using an undocumented command.
This
  is the procedure to switch to back UTC time:

  a) use the following command to confirm the unit is in UTC/GPS mode:

  :diag:gps:utc?

  if the response is 1 the unit is on UTC mode, if it is 0 the unit is in
GPS
  mode. If the unit is in UTC mode this will not solve the problem. If it is
  on GPS mode the following command will switch it to UTC

  :ptime:utc 1

  after this (depending on the firmware level) the unit will reset by itself
  and display/output the correct time, if the unit does not reset use the
  following command to reset it.


  :syst:pon

  ----------------------------
  NOTE: some older models do not accept the :ptime:utc command, in that case
  use the alternate way: (this will work also on the newer units)

  :diag:gps:utc 1

  after this (depending on the firmware level) the unit will reset by itself
  and display the correct time, if the unit does not reset use the following
  command to reset it.

  :syst:pon   <I had to power cycle my older firmware Z3801A at this point.
:syst:pon was not recognized.>


  ------------------------------

  the unit should be on UTC now.



  END FROM SYMMETRICOM
======================================================
```

7. [tacgps] Z3801A back on eBay... Don't bid more than $399... More...

```
From: bobhome@pacbell.net
Date: Sat, 06 Oct 2001 20:22:43 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40647-2001.10.06-22.48.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
Hi folks,

I spoke with the seller of Z3801A at Buylegacy yesterday and he will sell these receivers at $399 if you
 contact him directly. No point bidding more that the $399 opening bid on eBay!

contact information:  james@zrginc.com

Regards,
Bob
```

8. [tacgps] Is this a good deal?

```
From: "W. D." <WD@US-Webmasters.com>
Date: Mon, 08 Oct 2001 23:00:04 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
```

Message-ID: <LYR6754-40929-2001.10.08-23.25.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

HEWLETT PACKARD Z3801A RECEIVER
http://www.hitechcafe.com/eshop/product.asp?sku=Z3801A&dept_id=14

Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm

---
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9. [tacgps] Re: Is this a good deal? *NO*

From: bobhome@pacbell.net
Date: Tue, 09 Oct 2001 05:41:43 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40976-2001.10.09-08.07.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

$999 is NOT a good deal... James at ZRG has a quantity of Z3801A for $399.
Several of us have now bought from him with no problems. These are the same
receivers showing up on eBay from Buylegacy with a $399 starting bid.

Here's his email: james@zrginc.com

I also have a few setup notes based on recent experience with these boxes.
Details not included in the user's manual.- a possible power supply,
rs-232/rs-422 conversion, receiver mode settings, etc. Let me know if you
need a copy.

Regards,
Bob

----- Original Message -----
From: "W. D." <WD@US-Webmasters.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, October 08, 2001 9:00 PM
Subject: [tacgps] Is this a good deal?

HEWLETT PACKARD Z3801A RECEIVER
http://www.hitechcafe.com/eshop/product.asp?sku=Z3801A&dept_id=14

Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm

---
You are currently subscribed to tacgps as: bobhome@pacbell.net
To unsubscribe send a blank email to leave-tacgps-21982S@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] GPS status???

From: Bob Smith <bobsmith@i2020.net>
Date: Tue, 09 Oct 2001 09:30:36 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-40980-2001.10.09-08.56.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just as a point curiosity, given the current state of the world, has
there any change to the current GPS SA status??

        73, de bob, WA4YPV

--

--------- Avoid computer viruses -- Practice safe hex -------------
 * * Specializing in small, cost effective embedded control systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith@i2020.net   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] Re: HP 10544A schematics ?

From: Doug Bade <doug@clecom.com>
Date: Tue, 09 Oct 2001 12:46:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41027-2001.10.09-12.12.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I would be interested in this info, I now own one of the 10811 oscillator
and counter and wish to connect to GPS controller.. Thanks Doug

At 08:03 PM 10/2/01 -0700, you wrote:
>I can provide a schematic for the HP 10811A/B. I believe it is very
>similar to the 10544. The 10811 can be substituted for the 10544 in
>HP's equipment.
>
>Let me know if you would like them. I'll have to take them to work to
>scan them on a flat bed scanner as they are still in the manual.
>73,
>Dan - W6LSN

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12. [tacgps] Re: GPS status???

From: Dave Martindale <davem@cs.ubc.ca>
Date: Tue, 09 Oct 2001 10:08:58 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41033-2001.10.09-12.38.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 09:30 AM 09/10/2001 -0400, you wrote:
>Just as a point curiosity, given the current state of the world, has
>there any change to the current GPS SA status??

No, it hasn't changed. The US military apparently now has the capability of
jamming and/or spoofing GPS signals in a limited area whenever they want,
and have said they have no plans to turn SA back on.

To see more (far too much in fact) discussion of this, take a look at the
last month in the sci.geo.satellite-nav newsgroup.

         Dave

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13. [tacgps] Re: HP 10544A schematics ?

From: Mike73@aol.com
Date: Tue, 9 Oct 2001 13:47:05 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41039-2001.10.09-13.12.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In a message dated 10/9/01 12:48:00 PM Eastern Daylight Time, doug@clecom.com
writes:

> I would be interested in this info, I now own one of the 10811 oscillator
> and counter and wish to connect to GPS controller.. Thanks Doug

> >At 08:03 PM 10/2/01 -0700, you wrote:
> >I can provide a schematic for the HP 10811A/B. I believe it is very
> >similar to the 10544. The 10811 can be substituted for the 10544 in
> >HP's equipment.
==========
While not a schematic, here's a list of pinouts that might be helpful..... I
forget who sent this to me, but thanks for the info.
==========

The 10811 is a plug compatible replacement for instruments
designed for a 10544. But the 10544 may not be not plug
compatible with an instrument designed for a 10811 (since
the 10544 requires extra power connections and is not
designed to drive a 50R load).

HP 10544 (AT cut)

pin 1 - 10 MHz RF out (1000 R)
pin 2 - ground
pin 3 - Osc/Amp power *
pin 4 - Osc/Amp/RF ground
pin 5 - EFC ground
pin 6 - EFC Input *
pin 7 - NC
pin 8 - Oven controller power *
pin 9 - Oven controller ground
pin 10 - NC
pin 11 - Oven monitor
pin 12 - NC
pin 13 - NC
pin 14 - Oven power *
pin 15 - Oven ground

* Notes
- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
- Oven controller power +10.6 to 11.7 VDC (5 mA)
- Oven power is +15 to 30 VDC (2.5 W)
- EFC control range is -5 to +5 VDC

HP 10811 (SC cut)

pin 1 - 10 MHz RF out (50 R)
pin 2 - ground
pin 3 - Osc supply *
pin 4 - ground
pin 5 - ground
pin 6 - EFC Input *
pin 7 - NC
pin 8 - NC
pin 9 - NC
pin 10 - NC
pin 11 - Oven monitor
pin 12 - NC
pin 13 - NC
pin 14 - Oven power *
pin 15 - Oven ground

* Notes
- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
- Oven supply +20 to 30 VDC (2 W)
- EFC control range is -5 to +5 VDC

73,
Mike, N1JEZ
FN34im
"A closed mouth gathers no feet."

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: HP 10544A schematics ?

From: Doug Bade <doug@clecom.com>
Date: Tue, 09 Oct 2001 17:01:29 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41058-2001.10.09-16.26.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Great !!!!
         I printed it off to add to my documentation, that is a great
help.. Thanks again, Doug KB8GVQ

At 01:47 PM 10/9/01 -0400, you wrote:
>In a message dated 10/9/01 12:48:00 PM Eastern Daylight Time, doug@clecom.com
>writes:
>

> > I would be interested in this info, I now own one of the 10811 oscillator
> > and counter and wish to connect to GPS controller.. Thanks Doug
>
> > >At 08:03 PM 10/2/01 -0700, you wrote:
> > >I can provide a schematic for the HP 10811A/B. I believe it is very
> > >similar to the 10544. The 10811 can be substituted for the 10544 in
> > >HP's equipment.
>==============================
>While not a schematic, here's a list of pinouts that might be helpful..... I
>forget who sent this to me, but thanks for the info.
>==============================
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>designed for a 10544. But the 10544 may not be not plug
>compatible with an instrument designed for a 10811 (since
>the 10544 requires extra power connections and is not
>designed to drive a 50R load).
>
>HP 10544 (AT cut)
>
>pin 1 - 10 MHz RF out (1000 R)
>pin 2 - ground
>pin 3 - Osc/Amp power *
>pin 4 - Osc/Amp/RF ground
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>pin 7 - NC
>pin 8 - Oven controller power *
>pin 9 - Oven controller ground
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc/Amp power +10.6 to 11.7 VDC (15 mA) <100 uV noise
>- Oven controller power +10.6 to 11.7 VDC (5 mA)
>- Oven power is +15 to 30 VDC (2.5 W)
>- EFC control range is -5 to +5 VDC
>
>
>HP 10811 (SC cut)
>
>pin 1 - 10 MHz RF out (50 R)
>pin 2 - ground
>pin 3 - Osc supply *
>pin 4 - ground
>pin 5 - ground
>pin 6 - EFC Input *
>pin 7 - NC
>pin 8 - NC
>pin 9 - NC
>pin 10 - NC
>pin 11 - Oven monitor
>pin 12 - NC
>pin 13 - NC
>pin 14 - Oven power *
>pin 15 - Oven ground
>
>* Notes
>- Osc supply +11.0 to 13.5 VDC (30 mA) <100 uV noise
>- Oven supply +20 to 30 VDC (2 W)
>- EFC control range is -5 to +5 VDC

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15. [tacgps] Re: Is this a good deal? *NO*

From: "Bill Jones" <k8cu@copper.net>
Date: Tue, 9 Oct 2001 18:43:1
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41075-2001.10.09-19.08.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gents,

I contacted the Ebay seller (Buylegacy.com) directly at 619-425-0770
extension 101. I asked if I could purchase a Z3801A other than on Ebay. I
was told yes, at the $399.99 starting bid price. He told me Monday morning
that he "had about ten of them left". The seller mentioned that an
(approximate) 80 page copy of the users manual is included with each unit.

Thanks.

Bill, K8CU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: HP 10544A schematics ?

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Tue, 9 Oct 2001 23:15:43 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41107-2001.10.09-22.41.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug et al:

Check out this webpage re: the 10811, 10544A, Brooks Shera's gps controller,
etc. Hepful hints and a beautiful realization of the project are there:

http://home.teleport.com/~rewing/10mhz_construction.htm

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.qsl.net/w3sz

> -----Original Message-----
> From: bounce-tacgps-23685@lists.tapr.org
> [mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of Doug Bade
> Sent: Tuesday, October 09, 2001 5:01 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: HP 10544A schematics ?
>
>
> Great !!!!
>   I printed it off to add to my documentation, that is a great
> help.. Thanks again, Doug KB8GVQ
>
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: HP 10544A schematics ?

From: Doug Bade <doug@ohioaprs.net>
Date: Wed, 10 Oct 2001 08:39:03 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41143-2001.10.10-07.59.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for the tip, I had Bookmark-Ed this page already sometime ago, but
forgot why :-)... I really need to elaborate in bookmark titles more....
73, Doug KB8GVQ

At 11:15 PM 10/9/2001 -0400, you wrote:
>Doug et al:
>
>Check out this webpage re: the 10811, 10544A, Brooks Shera's gps controller,
>etc. Hepful hints and a beautiful realization of the project are there:
>
>http://home.teleport.com/~rewing/10mhz_construction.htm
>
>73,
>

>Roger Rehr
>W3SZ ex AA3QK, WA3JYM FN20ah
>2 Merrymount Road
>Reading, PA 19609-1718
>http://www.qsl.net/w3sz

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] HP 10544A schematics - second request

From: Marco Bruno <IK1ODO@libero.it>
Date: Wed, 10 Oct 2001 08:07:03 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41146-2001.10.10-08.07.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,

a few days a go I asked for a manual source or a copy of the HP 10544A
oven crystal oscillator, used in so many instruments.
I have received no valid help... only copies of the 10811A, wich is common.
I know it is almost interchangeable to the 10544A, but the internal
construction
is very different. Of the variuos manuals of HP instruments using the 10544A
that I have, none goes into details of the schematics. Also, no one of the
usual
service manual vendors seems to have it.

So, I wonder, has even HP released the schematics of the 10544A? I know
it was intended as a sealed, not user-repaireble unit. Is any expert able to
help?
I have several of them with different problems (blocked oven, auto-oscillating
output stage, invalid output level, unstable oven....) and I like to try a
repair.

Marco Bruno - IK1ODO

Marco Bruno - IK1ODO
spin.elec@tiscalinet.it

SPIN Electronics - www.spin-it.com

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19. [tacgps] Re: Is this a good deal? *NO*

From: "John R. Ackermann" <jra@febo.com>
Date: Wed, 10 Oct 2001 08:48:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41154-2001.10.10-08.14.25--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=iso-8859-1; format=flowed
Content-Transfer-Encoding: quoted-printable
Content-Disposition: inline

So, to those who've bought one... what's the general take on these units?=20
Are they a telecom-spec version of the regular HP GPS oscillator (can't=20
remember the model number)? Is the performance worth $399?

John

--On Tuesday, October 09, 2001 5:41 AM -0700 bobhome@pacbell.net wrote:

> $999 is NOT a good deal... James at ZRG has a quantity of Z3801A for =
$399.
> Several of us have now bought from him with no problems. These are the
> same receivers showing up on eBay from Buylegacy with a $399 starting =
bid.
>
> Here's his email: james@zrginc.com
>
> I also have a few setup notes based on recent experience with these =

boxes.
> Details not included in the user's manual.- a possible power supply,
> rs-232/rs-422 conversion, receiver mode settings, etc. Let me know if you
> need a copy.
>
> Regards,
> Bob
>
>
> ----- Original Message -----
> From: "W. D." <WD@US-Webmasters.com>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Monday, October 08, 2001 9:00 PM
> Subject: [tacgps] Is this a good deal?
>
>
> HEWLETT PACKARD Z3801A RECEIVER
> http://www.hitechcafe.com/eshop/product.asp?sku=3DZ3801A&dept_id=3D14
>
> Start Here to Find It Fast!=A9 -> http://www.US-Webmasters.com/start.htm
>
>
> ---
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>
>
>
>
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>

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20. [tacgps] VP Oncore Command Listing

From: randy@synergy-gps.com
Date: Wed, 10 Oct 2001 09:32:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41187-2001.10.10-11.57.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Guys,

Just a short note to let all you users of the old VP Oncore GPS
receiver know that we have added a complete command listing for
the VP in PDF format on our website. Since the VP manual was
never issued in electronic format (and it is no longer in print), it's
been tough for users to get information on some of the more
unusual commands (ask me how many times I have taken my VP
manual apart to FAX someone the @@Eg pages.....)

Anyway, I basically took Chapter 6 of the last revision of the
manual, scanned it in to my computer, formatted it, added some
helpful notes, and then created a pdf from it. Thanks to Rick
Hambly for catching some errors in the first go-round.

The file link is located at the bottom of the first page in the
"Technical Support" section on our website.

Randy Warner
Synergy Systems, LLC

Senior Applications Engineer
Synergy Systems, LLC P.O. Box 262250, San Diego, CA 92196
Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
 lat N 32.54' 43.9612 Lon W 117 06' 41.8060
Motorola's leading ONCORE GPS Distributor in the Americas

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21. [tacgps] Rubidium Frequency Standard FRK 250

From: HBonhorst@aol.com
Date: Wed, 10 Oct 2001 14:23:20 EDT
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41199-2001.10.10-13.51.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Some time ago I bought an used FRK 250 rubidium standard.
I was able to find an FRK (H or L) manual.
Now I want to add external freq. adjust input.
I´m urgently seeking an diagramm for 70387-2 powersupply board with some
parts of resonator board on it.
Thank you for any help.

Hubert
DB7ME

22. [tacgps] Re: Is this a good deal? *NO*

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Wed, 10 Oct 2001 23:31:59 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41281-2001.10.11-01.58.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> So, to those who've bought one... what's the general take on these units?
> Are they a telecom-spec version of the regular HP GPS oscillator (can't
> remember the model number)? Is the performance worth $399?
>
> John

Yes, it's a telecom OEM variation of the HP 58503
SmartClock and worth the price IMHO. As far as I
can tell at this point the Z3801A differs from the
normal 58503A/B in the following areas:

- industrial rack mounted rather than pretty case
- requires 48 VDC external power supply
- serial interface is RS-422 instead of RS-232
- some of the defaults differ (e.g., GPS vs UTC)
- uses the 6-channel Oncore (not 8-channel)
- log messages use hex-looking time stamps
- 1 PPS is non-standard (sort of low voltage ECL)
- the 10811 oscillator is inside a custom outer oven

But for $399 these are not major problems. Add the
power supply and 5 V patch antenna and it makes
a very fine GPSDO. The standalone performance of
the unusual double oven 10811 OCXO is in the low
12's or high 13's so it's a nice frequency standard
even if you never plug in the GPS antenna. I have
Allan plots if you're interested.

/tvb

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23. [tacgps] Re: Is this a good deal? *NO*

From: "k8cu" <k8cu@copper.net>
Date: Thu, 11 Oct 2001 05:59:02 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41285-2001.10.11-05.26.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gents,

Information I have just received (thank to Jim Howard):

"These units use HP's best oven oscillator, the HP10811D/E.
This oscillator unit costs about $2400 in the HP catalog when
screened for phase and stability. These GPS units have the oscillator
housed in a double oven......The HP10811D/E is also used in their
best signal generators (HP 8663b)....

This brings up the possibility that some guys will buy these units for
salvage value of the oven oscillator alone!

Thanks.

Bill, K8CU

----- Original Message -----
From: "Tom Van Baak" <tvb@leapsecond.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, October 11, 2001 2:31 AM
Subject: [tacgps] Re: Is this a good deal? *NO*

> > So, to those who've bought one... what's the general take on these
units?
> > Are they a telecom-spec version of the regular HP GPS oscillator (can't
> > remember the model number)? Is the performance worth $399?
> >
> > John
>
> Yes, it's a telecom OEM variation of the HP 58503
> SmartClock and worth the price IMHO. As far as I
> can tell at this point the Z3801A differs from the
> normal 58503A/B in the following areas:
>
> - industrial rack mounted rather than pretty case
> - requires 48 VDC external power supply
> - serial interface is RS-422 instead of RS-232
> - some of the defaults differ (e.g., GPS vs UTC)
> - uses the 6-channel Oncore (not 8-channel)
> - log messages use hex-looking time stamps
> - 1 PPS is non-standard (sort of low voltage ECL)
> - the 10811 oscillator is inside a custom outer oven
>
> But for $399 these are not major problems. Add the
> power supply and 5 V patch antenna and it makes
> a very fine GPSDO. The standalone performance of
> the unusual double oven 10811 OCXO is in the low
> 12's or high 13's so it's a nice frequency standard
> even if you never plug in the GPS antenna. I have
> Allan plots if you're interested.
>
> /tvb
>
>
> ---
> You are currently subscribed to tacgps as: k8cu@copper.net
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>

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24. [tacgps] Re: VP Oncore Command Listing

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 11 Oct 2001 07:34:16 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41290-2001.10.11-07.58.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Randy,

Thanks! for me, at least, wandering off to the hinterlands (sometimes
literally) and not always being able to drag along yet another binder,
this is marvelous!

Regards,
gerry
--
randy@synergy-gps.com wrote:
>
> Guys,
>
> Just a short note to let all you users of the old VP Oncore GPS
> receiver know that we have added a complete command listing for

> the VP in PDF format on our website. Since the VP manual was
> never issued in electronic format (and it is no longer in print), it's
> been tough for users to get information on some of the more
> unusual commands (ask me how many times I have taken my VP
> manual apart to FAX someone the @@Eg pages.....)
>
> Anyway, I basically took Chapter 6 of the last revision of the
> manual, scanned it in to my computer, formatted it, added some
> helpful notes, and then created a pdf from it. Thanks to Rick
> Hambly for catching some errors in the first go-round.
>
> The file link is located at the bottom of the first page in the
> "Technical Support" section on our website.
>
> Randy Warner
> Synergy Systems, LLC
>
> Senior Applications Engineer
> Synergy Systems, LLC P.O. Box 262250, San Diego, CA 92196
> Voice (858) 566-0666 Toll Free 888 479-6749
>   Fax (858) 566-0768 Web Site http://www.synergy-gps.com
> lat N 32.54' 43.9612 Lon W 117 06' 41.8060
> Motorola's leading ONCORE GPS Distributor in the Americas
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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25. [tacgps] Re: Is this a good deal? *NO*

From: "John R. Ackermann" <jra@febo.com>
Date: Thu, 11 Oct 2001 08:41:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41291-2001.10.11-08.06.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

Now what we need is a head-to-head test of whether Brooks' controller can
do a better job with this oscillator than the HP design... (add in the
newer 8 channel Oncore versus the older one for an additional comparison).

John

--On Thursday, October 11, 2001 5:59 AM -0400 k8cu <k8cu@copper.net> wrote:

> Gents,
>
> Information I have just received (thank to Jim Howard):
>
> "These units use HP's best oven oscillator, the HP10811D/E.
> This oscillator unit costs about $2400 in the HP catalog when
> screened for phase and stability. These GPS units have the oscillator
> housed in a double oven......The HP10811D/E is also used in their
> best signal generators (HP 8663b)....
>
> This brings up the possibility that some guys will buy these units for
> salvage value of the oven oscillator alone!
>
> Thanks.
>
> Bill, K8CU
>
> ----- Original Message -----
> From: "Tom Van Baak" <tvb@leapsecond.com>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

> Sent: Thursday, October 11, 2001 2:31 AM
> Subject: [tacgps] Re: Is this a good deal? *NO*
>
>
>> > So, to those who've bought one... what's the general take on these
> units?
>> > Are they a telecom-spec version of the regular HP GPS oscillator (can't
>> > remember the model number)? Is the performance worth $399?
>> >
>> > John
>>
>> Yes, it's a telecom OEM variation of the HP 58503
>> SmartClock and worth the price IMHO. As far as I
>> can tell at this point the Z3801A differs from the
>> normal 58503A/B in the following areas:
>>
>> - industrial rack mounted rather than pretty case
>> - requires 48 VDC external power supply
>> - serial interface is RS-422 instead of RS-232
>> - some of the defaults differ (e.g., GPS vs UTC)
>> - uses the 6-channel Oncore (not 8-channel)
>> - log messages use hex-looking time stamps
>> - 1 PPS is non-standard (sort of low voltage ECL)
>> - the 10811 oscillator is inside a custom outer oven
>>
>> But for $399 these are not major problems. Add the
>> power supply and 5 V patch antenna and it makes
>> a very fine GPSDO. The standalone performance of
>> the unusual double oven 10811 OCXO is in the low
>> 12's or high 13's so it's a nice frequency standard
>> even if you never plug in the GPS antenna. I have
>> Allan plots if you're interested.
>>
>> /tvb
>>
>>
>> ---
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>> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>>
>
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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>
>

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26. [tacgps] Z3801A and Shera AV data. Link to plots...

From: "Robert Leichner" <bobhome@pacbell.net>
Date: Thu, 11 Oct 2001 9:55:18
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41319-2001.10.11-10.20.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Here's a bit of comparison data between a Z3801A and Brooks Shera PLL.

First, a brief description of the two clocks as tested.

Z3801A:

A previous post identifies the oscillator in the Z3801A. Quoting from that
post (thank you Bill and Howard!):

"These units use HP's best oven oscillator, the HP10811D/E.
This oscillator unit costs about $2400 in the HP catalog when
screened for phase and stability. These GPS units have the oscillator
housed in a double oven......The HP10811D/E is also used in their
best signal generators (HP 8663b)...."

Complete the clock with an Oncore VT GPS receiver and Motorola 683xx
controller.

My implementation of the Shera PLL:

I was running the Shera PLL with max filters (N=7, alpha filter enabled),
and am using a prime MTI-260 5.0 MHz SC-cut double oven crystal... the
double oven crystal alone has around a $450 list price. The controller is a
PIC running Brooks' code. 1pps was from a Motorola Oncore UT.

Look here for more data on the MTI crystal:
  http://www.mti-milliren.com/260.html
  http://www.mti-milliren.com/published_papers.html

Measurement system:

The measurement system is in a lab near where I work. Reference is an
ensemble of two HP Cesium clocks divided down to 5.0 MHz. The environment
is an industrial lab with noticeably more stable temperatures than the
average home shop.

The raw phase data comes from an HP 8405A vector voltmeter measuring phase
error between the reference 5.0 MHz on channel A, and a unit under test on
channel B. The +/- 100 nS range on the plot represents +/- 180 degrees of
phase difference between A and B channels. The system sequentially measures
this phase error for each of four units under test, with a full cycle every
100 seconds.

Data plots:

"http://home.pacbell.net/leichner/images/plot both.jpg"
Trace "A4" in the center is the Z3801A, trace "A3" slightly offset low is
the Shera PLL. The small offset of trace A3 from center is a function of
the length of coax between the UUT and phase measurement system. This plot
shows 16+ days of data.

"http://home.pacbell.net/leichner/images/z3801a_plot.jpg"
AV plot and values for the Z3801A.

"http://home.pacbell.net/leichner/images/ebs_plot.jpg"
AV plot and values for the Shera PLL.

I'm not qualified to comment on the plots. Still, I do note that the Shera
controller was about the same as the Z3801, except in the region of a few
hundred to a few thousand seconds where it approached a factor of two
better than the Z3801.

There are several variables that could have contributed to the difference
including GPS receiver, crystal, and controller PLL code. Can anyone
comment on the region where these differences are present? The interval
seems like it could be in the range dominated by PLL controller effects - a
bit long for basic crystal stability and noise, short for GPS dominated
effects. Again, I'm just not qualified to make this determination, and
don't have the resources to narrow it down by experimentation.

Regards,
Bob

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27. [tacgps] Re: Z3801A and Shera AV data. Link to plots...

From: "Robert Leichner" <bobhome@pacbell.net>
Date: Thu, 11 Oct 2001 10:3:13
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41320-2001.10.11-10.28.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I seem to have lost an underscore between "plot" and "both" in the original
post above. The correct URL is:

"http://home.pacbell.net/leichner/images/plot_both.jpg"

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28. [tacgps] Schematic for HP-10544A

From: Jeremy Nichols <jeremynichols@sprintmail.com>
Date: Thu, 11 Oct 2001 08:47:48 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41325-2001.10.11-11.03.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a schematic of the 10544A in my HP-5340A counter manual. The schematic is
somewhat general, as it doesn't provide details for the internals, beyond boxes
labeled by function. However, it does show the pinout of the 10544A's edge card.
If that would be helpful, I can scan and email the schematic to you. Do you have a
format preference?

Jeremy Nichols   N6WFO
Santa Rosa, California
==========

> Subject: HP 10544A schematics - second request
> From: Marco Bruno <IK1ODO@libero.it>
> X-Message-Number: 2
>
> Hi all,
>
> a few days a go I asked for a manual source or a copy of the HP 10544A
> oven crystal oscillator, used in so many instruments.
> I have received no valid help... only copies of the 10811A, wich is common.
> I know it is almost interchangeable to the 10544A, but the internal
> construction
> is very different. Of the variuos manuals of HP instruments using the 10544A
> that I have, none goes into details of the schematics. Also, no one of the
> usual
> service manual vendors seems to have it.
>
> So, I wonder, has even HP released the schematics of the 10544A? I know
> it was intended as a sealed, not user-repaireble unit. Is any expert able to
> help?
> I have several of them with different problems (blocked oven, auto-oscillating
> output stage, invalid output level, unstable oven....) and I like to try a
> repair.
>
> Marco Bruno - IK1ODO

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] Re: Schematic for HP-10544A

From: Marco Bruno <IK1ODO@libero.it>
Date: Thu, 11 Oct 2001 14:33:56 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41354-2001.10.11-14.33.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In 20.41 11/10/01 , hai scritto:
>I have a schematic of the 10544A in my HP-5340A counter manual. The
>schematic is
>somewhat general, as it doesn't provide details for the internals, beyond
boxes
>labeled by function. However, it does show the pinout of the 10544A's edge
>card.
>If that would be helpful, I can scan and email the schematic to you. Do you
>have a
>format preference?
>
>Jeremy Nichols   N6WFO

Hi Jeremy,

thanks for help, but I already have it... it is the real detailed schematic
that's missing!

73's- Marco

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

30. [tacgps] Re: HP 10544A schematics ?

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Thu, 11 Oct 2001 13:34:42 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41362-2001.10.11-16.00.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Hi all,
>
> anyone there has the service manual or at least the schematics of the HP
10544A
> OCXO?
>
> It seems hard to find from the usual manual dealers.
>
> Marco Bruno - IK1ODO - Italy

See the scan of the schematics for the 10544A oscillator:
    http://www.leapsecond.com/museum/10544/

If you need specs or other information let me know.

/tvb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

31. [tacgps] Re: HP 10544A schematics ?

From: Marco Bruno <IK1ODO@libero.it>
Date: Fri, 12 Oct 2001 07:57:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41444-2001.10.12-07.57.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>
>See the scan of the schematics for the 10544A oscillator:
>   http://www.leapsecond.com/museum/10544/
>
>If you need specs or other information let me know.
>
>/tvb
>
Thank you to Tom Van Baak, Ron Catmur and others. This is what
I was looking for!

73 - Marco IK1ODO

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

32. [tacgps] Z3801A J3 Pinout

From: Doug Bade <doug@clecom.com>
Date: Fri, 12 Oct 2001 11:12:36 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41463-2001.10.12-10.38.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has anyone found the complete pin out for the DB25 connector? I did not
see it in the manual, and have only caught some of the pins posted... I am
looking for +5vdc source +_ to run an interface.. Thanks, Doug

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

33. [tacgps] Re: Z3801A J3 Pinout

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Fri, 12 Oct 2001 08:52:02 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41464-2001.10.12-11.17.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Has anyone found the complete pin out for the DB25 connector? I did not
> see it in the manual, and have only caught some of the pins posted... I am
> looking for +5vdc source +_ to run an interface.. Thanks, Doug

Try page 2-7 of the manual. If your manual doesn't
have that page then visit:

http://www.leapsecond.com/museum/z3801a/pins.htm

There's no 5 VDC that I can see. You can always
get it from the PCB inside. It's probably not a good
idea to steal 5V from the GPS antenna N connector.

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

34. [tacgps] Re: Z3801A J3 Pinout

From: Doug Bade <doug@clecom.com>
Date: Fri, 12 Oct 2001 13:28:11 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41480-2001.10.12-12.54.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Actually there are some pins marked un-connected, and wondering if there
was any more complete docs.. Thanks, anyhow.. Doug

At 08:25 AM 10/12/01 -0700, you wrote:
> > Has anyone found the complete pin out for the DB25 connector? I did not
> > see it in the manual, and have only caught some of the pins posted... I am
> > looking for +5vdc source +_ to run an interface.. Thanks, Doug
>
>Page 2-7, no?

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

35. [tacgps] HP Z3801A Interface Schematic

From: Doug Bade <doug@clecom.com>
Date: Fri, 12 Oct 2001 14:33:38 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41486-2001.10.12-13.59.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

To anyone buying these units I have an alternative to the $45-400
rs-422-rs232 adapter. I breadboarded a prototype of the interface, and need
to make a better schematic to distribute, but it works with a $4.90 chip
from Digikey and a few caps and jumpers and a Radio Shack Breadboard.

If anyone is interested I will PDF my schematic and send out..

IC is a LT1318 by Linear Technology.. has 232 and 422 in it (24 Pin)..
Anyone who has played with a max232 family chip it is a no brain-er...

My first HP Z3801A is 16% done in Survey mode... What a bargain at
$399.00...   73, Doug KB8GVQ

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

36. [tacgps] RE: HP Z3801A Interface Schematic

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Fri, 12 Oct 2001 15:13:59 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41489-2001.10.12-14.39.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Doug,

Thanks for the offer...

I have the PS and connectors...just waiting for UPS to deliver the Z3801A...

I'd appreciate a copy of your schematic!

Thanks in advance,

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.qsl.net/w3sz

> -----Original Message-----
> From: bounce-tacgps-23685@lists.tapr.org
> [mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of Doug Bade
> Sent: Friday, October 12, 2001 2:34 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] HP Z3801A Interface Schematic
>
>
>   To anyone buying these units I have an alternative to
> the $45-400
> rs-422-rs232 adapter. I breadboarded a prototype of the
> interface, and need
> to make a better schematic to distribute, but it works with a
> $4.90 chip
> from Digikey and a few caps and jumpers and a Radio Shack Breadboard.
>
> If anyone is interested I will PDF my schematic and send out..
>
> IC is a LT1318 by Linear Technology.. has 232 and 422 in it (24 Pin)..
> Anyone who has played with a max232 family chip it is a no brain-er...
>
>
> My first HP Z3801A is 16% done in Survey mode... What a bargain at
> $399.00...   73, Doug KB8GVQ
>
>
> ---
> You are currently subscribed to tacgps as: r1ehr2@epix.net
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

37. [tacgps] RE: HP Z3801A Interface Schematic

From: Doug Bade <doug@clecom.com>
Date: Fri, 12 Oct 2001 16:02:40 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: dsp-10@qth.net
Message-ID: <LYR6754-41495-2001.10.12-15.28.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Group;

         I sent to him directly, but will post a link for anyone who
wants.. The LT1318 PDF is there too..

it is; http://www.ohioaprs.net/files/doug/GPS-DSP/

         This area is for my DSP-10 and TAC2 public files.. I will make a
better schematic of the 422-232 converter when I have a minute..
         This is a folder, find the rs422-232.pdf or what else you may
need.. Doug KB8GVQ

At 03:13 PM 10/12/01 -0400, you wrote:
>Hi Doug,
>
>Thanks for the offer...
>

>I have the PS and connectors...just waiting for UPS to deliver the Z3801A...
>
>I'd appreciate a copy of your schematic!
>
>Thanks in advance,
>
>73,
>
>Roger Rehr
>
> > -----Original Message-----
> > From: bounce-tacgps-23685@lists.tapr.org
> > [mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of Doug Bade
> > Sent: Friday, October 12, 2001 2:34 PM
> > To: TAPR Special Interest Group
> > Subject: [tacgps] HP Z3801A Interface Schematic
> >
> >
> >   To anyone buying these units I have an alternative to
> > the $45-400
> > rs-422-rs232 adapter. I breadboarded a prototype of the
> > interface, and need
> > to make a better schematic to distribute, but it works with a
> > $4.90 chip
> > from Digikey and a few caps and jumpers and a Radio Shack Breadboard.
> >
> > If anyone is interested I will PDF my schematic and send out..
> >
> > IC is a LT1318 by Linear Technology.. has 232 and 422 in it (24 Pin)..
> > Anyone who has played with a max232 family chip it is a no brain-er...
> >
> >
> > My first HP Z3801A is 16% done in Survey mode... What a bargain at
> > $399.00...   73, Doug KB8GVQ

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38. [tacgps] Re: Z3801A and Shera AV data. Link to plots...

From: Jeff <barnie@flash.net>
Date: Fri, 12 Oct 2001 14:01:51 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41503-2001.10.12-16.27.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Bob:
This is fascinating data. I was wondering if you have similar data for the
lower values of N? We might be able to see the effects of the controller that
way.
(I envy your access to the Cesium clocks!). Have you tried constructing "poor
man's
Sigma-y" plots from the phase data output by the Shera controller? Does it
work?
Do you have any plots of the DAC output from the Shera controller on your MTI?
It would be interesting to see how "hard" the controller is working to control
the
MTI.

Brooks:
Do you have any insights you can share? Any idea how much of the difference
between these plots is due to the 10811 and the MTI?

Does anyone have phase noise plots for the 10811 similar to those on the MTI
page?

Jeff Vollin

Robert Leichner wrote:

> Here's a bit of comparison data between a Z3801A and Brooks Shera PLL.
>
> First, a brief description of the two clocks as tested.
>
> Z3801A:
>
> A previous post identifies the oscillator in the Z3801A. Quoting from that
> post (thank you Bill and Howard!):

>
> "These units use HP's best oven oscillator, the HP10811D/E.
> This oscillator unit costs about $2400 in the HP catalog when
> screened for phase and stability. These GPS units have the oscillator
> housed in a double oven......The HP10811D/E is also used in their
> best signal generators (HP 8663b)...."
>
> Complete the clock with an Oncore VT GPS receiver and Motorola 683xx
> controller.
>
> My implementation of the Shera PLL:
>
> I was running the Shera PLL with max filters (N=7, alpha filter enabled),
> and am using a prime MTI-260 5.0 MHz SC-cut double oven crystal... the
> double oven crystal alone has around a $450 list price. The controller is a
> PIC running Brooks' code. 1pps was from a Motorola Oncore UT.
>
> Look here for more data on the MTI crystal:
>   http://www.mti-milliren.com/260.html
>   http://www.mti-milliren.com/published_papers.html
>
> Measurement system:
>
> The measurement system is in a lab near where I work. Reference is an
> ensemble of two HP Cesium clocks divided down to 5.0 MHz. The environment
> is an industrial lab with noticeably more stable temperatures than the
> average home shop.
>
> The raw phase data comes from an HP 8405A vector voltmeter measuring phase
> error between the reference 5.0 MHz on channel A, and a unit under test on
> channel B. The +/- 100 nS range on the plot represents +/- 180 degrees of
> phase difference between A and B channels. The system sequentially measures
> this phase error for each of four units under test, with a full cycle every
> 100 seconds.
>
> Data plots:
>
> "http://home.pacbell.net/leichner/images/plot both.jpg"
> Trace "A4" in the center is the Z3801A, trace "A3" slightly offset low is
> the Shera PLL. The small offset of trace A3 from center is a function of
> the length of coax between the UUT and phase measurement system. This plot
> shows 16+ days of data.
>
> "http://home.pacbell.net/leichner/images/z3801a_plot.jpg"
> AV plot and values for the Z3801A.
>
> "http://home.pacbell.net/leichner/images/ebs_plot.jpg"
> AV plot and values for the Shera PLL.
>
> I'm not qualified to comment on the plots. Still, I do note that the Shera
> controller was about the same as the Z3801, except in the region of a few
> hundred to a few thousand seconds where it approached a factor of two
> better than the Z3801.
>
> There are several variables that could have contributed to the difference
> including GPS receiver, crystal, and controller PLL code. Can anyone
> comment on the region where these differences are present? The interval
> seems like it could be in the range dominated by PLL controller effects - a
> bit long for basic crystal stability and noise, short for GPS dominated
> effects. Again, I'm just not qualified to make this determination, and
> don't have the resources to narrow it down by experimentation.
>
> Regards,
> Bob
>
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

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39. [tacgps] RE: HP Z3801A Interface Schematic

From: Doug Bade <doug@clecom.com>
Date: Fri, 12 Oct 2001 17:17:02 -0400

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41504-2001.10.12-16.42.36--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

IN the rs422-232.pdf file I messed up on docs, please correct or re-
download.. Thanks, Doug KB8GVQ

I missed a pin number pin 6 on db-25 was supposed to be pin 16. New PDF at
http://www.ohioaprs.net/files/doug/GPS-DSP/

At 04:47 PM 10/12/01 -0400, you wrote:
>Thanks, Doug!
>
>Looks great...
>
>73,
>
>Roger Rehr
>W3SZ ex AA3QK, WA3JYM FN20ah
>2 Merrymount Road
>Reading, PA 19609-1718
>http://www.qsl.net/w3sz
>
>
> > -----Original Message-----
> > From: Doug Bade [mailto:doug@clecom.com]
> > Sent: Friday, October 12, 2001 3:43 PM
> > To: W3SZ R Rehr
> > Subject: Re: [tacgps] RE: HP Z3801A Interface Schematic
> >
> >
> > Here it is, it is a little rough, but I will CAD it when i
> > have a minute.. Doug
> >
> >
> >
> > At 03:13 PM 10/12/01 -0400, you wrote:
> > >Hi Doug,
> > >
> > >Thanks for the offer...
> > >
> > >I have the PS and connectors...just waiting for UPS to
> > deliver the Z3801A...
> > >
> > >I'd appreciate a copy of your schematic!
> > >
> > >Thanks in advance,
> > >
> > >73,
> > >
> > >Roger Rehr
> > >W3SZ ex AA3QK, WA3JYM FN20ah
> > >2 Merrymount Road
> > >Reading, PA 19609-1718
> > >http://www.qsl.net/w3sz
> > >
> > >
> > > > -----Original Message-----
> > > > From: bounce-tacgps-23685@lists.tapr.org
> > > > [mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of Doug Bade
> > > > Sent: Friday, October 12, 2001 2:34 PM
> > > > To: TAPR Special Interest Group
> > > > Subject: [tacgps] HP Z3801A Interface Schematic
> > > >
> > > >
> > > >   To anyone buying these units I have an alternative to
> > > > the $45-400
> > > > rs-422-rs232 adapter. I breadboarded a prototype of the
> > > > interface, and need
> > > > to make a better schematic to distribute, but it works with a
> > > > $4.90 chip
> > > > from Digikey and a few caps and jumpers and a Radio Shack
> > Breadboard.
> > > >
> > > > If anyone is interested I will PDF my schematic and send out..
> > > >

> > > > IC is a LT1318 by Linear Technology.. has 232 and 422 in
> > it (24 Pin)..
> > > > Anyone who has played with a max232 family chip it is a
> > no brain-er...
> > > > >
> > > > >
> > > > > My first HP Z3801A is 16% done in Survey mode... What a bargain at
> > > > > $399.00...   73, Doug KB8GVQ
> > > > >
> > > > >
> > > > > ---
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> > > > > To unsubscribe send a blank email to
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> > > > >
> > > > >
> > > >
> > > >
> > > >---
> > >>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
> > >>To unsubscribe send a blank email to
> > > leave-tacgps-6754G@lists.tapr.org
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

40. [tacgps] Choke Ring Antenna construction

From: Doug Bade <doug@clecom.com>
Date: Sat, 13 Oct 2001 18:25:51 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41621-2001.10.13-17.46.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I recall someone had home brewed a choke ring GPS antenna out of Pie
plates.. or such .. Does anyone have any experience with a Homemade Antenna
which would be a good match for the HP Z3801A receivers.. I get a lot of
ground clutter reflections at my office.. Any thoughts?? I would rather not
shuck out some bucks for a real commercial one.. 73, Doug KB8GVQ

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

41. [tacgps] Re: Choke Ring Antenna construction

From: "k8cu" <k8cu@copper.net>
Date: Sat, 13 Oct 2001 19:10:26 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41628-2001.10.13-18.37.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Doug,

I was thinking along the same lines. I am now building a homemade
GPS Helix antenna for the HP Z3801A receiver. I haven't tried it yet
but it does show promise. Easy to build, even easier on the pocketbook.

Checkout Http://www.ggrweb.com/article/gulley.html

I have cross checked his dimensions against the ARRL Antenna Book
information, and he is pretty close. I did modify mine to include the ARRL
preferred method of obtaining a Z match close to 50 ohms.

I intend to fix mount this antenna on a vent stack on my home. The article
illustrates a method for pipe mounting. I will probably feed with
a short run of hardline, and use no amplifier. The Helix gain will
probably compensate for the lack of an amp, and the inherent Helix
directivity may help shield from local problems. I'll let you know how
it works out.

ALso, for those interested in the RS232 to RS422 interface subject,
I have expanded upon Doug's original posting, and a .pdf file is available
that describes three different methods to interface the Z3801A GPS receiver.
Doug has been kind enough to give this file a home. Checkout
Http://Ohioaprs.net/files/doug/gps-dsp/k8cu-gpsinterface.pdf

Thanks.

Bill, K8CU

that
----- Original Message -----
From: "Doug Bade" <doug@clecom.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, October 13, 2001 6:25 PM
Subject: [tacgps] Choke Ring Antenna construction

> I recall someone had home brewed a choke ring GPS antenna out of Pie
> plates.. or such .. Does anyone have any experience with a Homemade
Antenna
> which would be a good match for the HP Z3801A receivers.. I get a lot of
> ground clutter reflections at my office.. Any thoughts?? I would rather
not
> shuck out some bucks for a real commercial one.. 73, Doug KB8GVQ
>
>
> ---
> You are currently subscribed to tacgps as: k8cu@copper.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

42. [tacgps] Fw: Corrected URL for Z3801A interface schematic

From: "k8cu" <k8cu@copper.net>
Date: Sat, 13 Oct 2001 19:33:57 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41631-2001.10.13-19.00.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

----- Original Message -----
From: "k8cu" <k8cu@copper.net>
To: "K8CU" <k8cu@copper.net>
Sent: Saturday, October 13, 2001 7:32 PM
Subject: Corrected URL for Z3801A interface schematic

> Gents,
>
> It turns out uppercase IS important for this URL.
>
> Try Http://Ohioaprs.net/files/doug/GPS-DSP/K8CU-gpsinterface.pdf
>
> Thanks.
>
> Bill, K8CU
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

43. [tacgps] Re: Choke Ring Antenna construction

From: Doug Bade <doug@clecom.com>
Date: Sat, 13 Oct 2001 21:53:28 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41643-2001.10.13-21.13.44--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

To anyone trying to access, the link is case sensitive.. copy the
link exactly as http://www.ohioaprs.net/files/doug/GPS-DSP/KB8GVQ-RS422-232.pdf

         Sorry but the server is not case in-sensitive... The folder has
other related info too...Doug KB8GVQ

At 07:10 PM 10/13/2001 -0400, you wrote:
>Hi Doug,

>
>I was thinking along the same lines. I am now building a homemade
>GPS Helix antenna for the HP Z3801A receiver. I haven't tried it yet
>but it does show promise. Easy to build, even easier on the pocketbook.
>
>Checkout Http://www.ggrweb.com/article/gulley.html
>
>I have cross checked his dimensions against the ARRL Antenna Book
>information, and he is pretty close. I did modify mine to include the ARRL
>preferred method of obtaining a Z match close to 50 ohms.
>
>I intend to fix mount this antenna on a vent stack on my home. The article
>illustrates a method for pipe mounting. I will probably feed with
>a short run of hardline, and use no amplifier. The Helix gain will
>probably compensate for the lack of an amp, and the inherent Helix
>directivity may help shield from local problems. I'll let you know how
>it works out.
>
>ALso, for those interested in the RS232 to RS422 interface subject,
>I have expanded upon Doug's original posting, and a .pdf file is available
>that describes three different methods to interface the Z3801A GPS receiver.
>Doug has been kind enough to give this file a home. Checkout
>Http://Ohioaprs.net/files/doug/gps-dsp/k8cu-gpsinterface.pdf
>
>Thanks.
>
>Bill, K8CU

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

44. [tacgps] Re: Choke Ring Antenna construction

From: "Lyle Johnson" <wa7gxd@email.msn.com>
Date: Sat, 13 Oct 2001 20:03:06 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41648-2001.10.13-22.28.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello!

> I intend to fix mount this antenna on a vent stack on my home. The article
> illustrates a method for pipe mounting. I will probably feed with
> a short run of hardline, and use no amplifier. The Helix gain will
> probably compensate for the lack of an amp,...

Be careful!

GPS receivers are just a system component, and for the system to actually
work well (as opposed to appearing to work at all, and thus assumed to work
well) you must keep in mind the way the receiver was designed.

The Motorola PVT-6/early Oncore units used in the Z3801A expected to have
the matching Motorola antenna attached, or an antenna/feedline system with
similar overall charateristics.

The helix antenna may well give you the directivity/pattern you seek. But
leaving out the preamp may be a mistake.

The Motorola antenna (ANT62301A/B) of the era when the Z3801A was built
included a preamplifier with 24 dB gain, a noise figure of around 2.5 dB and
expected 6-10 dB of cable loss. You can probably cheat and reduce the gain
some, but having a system with no preamp will give the receiver a signal
much weaker than it is designed to accept, and likely with a degraded
signal-to-noise ratio since the cable loss will directly add to the noise
perceived by the receiver. And the 1st rf stage of the receiver may be quite
noisy since it expected a preamp to handle this aspect of the receiver
system.

Be aware you can also overdrive the receiver with too much gain in the
preamp combined with too little loss in the feedline! You should consider
designing your pre-amp/feedline system to have an overall gain in the range
of 12-26 dB. Th preamp can probably be made from a simple MMIC. But
leaving the preamp out, or having too much gain in front of the receiver
module, can give you all sorts of hard-to-trace problems.

Enjoy!

Lyle KK7P

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

45. [tacgps] Re: Choke Ring Antenna construction

From: Dave Martindale <davem@cs.ubc.ca>
Date: Sat, 13 Oct 2001 20:25:17 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41650-2001.10.13-22.48.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I was thinking along the same lines. I am now building a homemade
>GPS Helix antenna for the HP Z3801A receiver. I haven't tried it yet
>but it does show promise. Easy to build, even easier on the pocketbook.
>
>Checkout Http://www.ggrweb.com/article/gulley.html

That's a particularly bad idea for a GPS antenna. I was sceptical, built one for myself, and sure enough...

The antenna is dimensioned properly, is easy to build, and works really well for picking up whichever one satellite you point it at. It's not bad for anything up to 30 degrees off axis, either. But it has its first null around 45 degrees off axis, and several more before you reach 90 degrees off axis. If you aim it upwards, you'll get really good reception for satellites nearly overhead, poor reception near the horizon, and there will be some elevations for which satellites completely "disappear" because they're sitting in one of the nulls.

An 8-turn helix is just far too directional for use as a GPS antenna, which needs to simultaneously receive signals from an entire hemisphere.

A while ago, someone (Tom Clark?) reported building a 2-turn helix on a yoghurt container. With only 2 turns, it's not very directional, and that's exactly what you need. You could build an "industrial strength" version using ABS pipe (as suggested in the article referred to above) instead of the yoghurt container, but you probably don't want to go much beyond 2 turns.

Of course, with 2 turns the gain is a lot lower than 8 turns, so you may have to use a preamp like Tom did.

Other possibilities: there were plans in QST a number of years back for building an air-dielectric patch antenna with nothing more than a couple of brass plates and some nylon spacers. It works (I built one of them too). I've also seen plans for installing a preamp on the underside of this antenna - if you make the ground plane out of double-sided PC board, you can leave the upper surface solid copper as one of the antenna elements, and etch microstrip transmission line plus all the traces for the preamp on the lower surface foil.

There are also plans for a GPS-frequency quadrifilar helix antenna somewhere on the web.

        Dave

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46. [tacgps] Re: Choke Ring Antenna construction

From: "Dr. Tom Clark" <tac@clark.net>
Date: Sun, 14 Oct 2001 00:25:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41658-2001.10.13-23.51.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Concerning all these antenna comments:

Some of the info/photos on my choke ring, helix etc antennas are on my old aleph web site at NASA Goddard.

I retired from NASA last June but still have permission/access to that material. Unfortunately, aleph is down at the moment with a bad power supply. When it comes back up, I'll post the pointers. Meanwhile I'll try to find an alternate web site for all my old stuff.

The Yogurt antenna was a 2-turn helix wound with copper foil tape on a disposable Yoplait yogurt cup. An ERA-3 MMIC was mounted at the antenna feed. Worked well, but mechanically the preamp mounting left a bit to be desired and the cup proved to be biodegradable (or perhaps UV degradable -- the plastic basically disintegrated!) when used outside.

Another helix design was the infamous "Helibowl" -- a two-turn helix wound on a disposable plastic drinking cup. The original design was done by Don Spitzmesser @ JPL and evolutionary versions were done by many in the professional GPS community (including me). There are a three hits on http://www.google.com is you search "Helibowl"; an interesting reference is on page 3 of http://www.tc.faa.gov/aar201/Success/OU.pdf.

The Helibowl antenna was usable all the way from L2 and the 23 cm amateur band thru GPS L1 and up to the 13 cm amateur band. The "bowl" was a hemispheric salad mixing bowl available for a couple of $$ at you local kitchenware store. You select the diameter D of the bowl for the beamwidth you want; the pattern was a pretty good [J1(x)/x]**2 (in power) with a beamwidth (FWHM) of about 1.2*(lambda/D) radians (the old Airy formula for an optical telescope). For a 6" salad bowl at GPS L1, this yields about

     (1.2) * (20 cm wavelength)/(6"=15 cm bowl) = 1.6 radians = 92 degrees

Since this is the FWHM Full-width of the beam at -3 dB, the -3dB point is at about 44 deg elevation. An 8" bowl gives a smaller beam (i.e. more gain) by a factor of 6/8.

As a lark, I entered a Helibowl in the antenna range contest at CSVHFS some years ago (I'd guess 1994 -- and the CSVHFS web site http://www.csvhfs.org only shows 1995 and later). The gain measured on the range at 1296 & 2304 matched the predictions after a 3 dB correction was made for circular polarization. I also ran the antenna on the precision indoor range at GSFC and the results were quite good.

When aleph comes back up you will also find photos of my 12" diameter choke ring antenna. The central element is a standard Motorola ANT97 amplified patch. Rings are made using 6", 8" and 10" air conditioning duct caps (2" tall) plus a 2" deep x 12" pie pan. The central "pedestal" is made from a standard octagonal 4" diameter electrical outlet box. The antenna was painted in Rustoleum and resides in a 15" diameter plastic cake cover. Works like a champ. Amplitude and phase pattern comparisons with "pro" antennas were run on the Goddard antenna range and were included in the paper presented by Bruce Shupler and me at the ION meeting in Salt Lake 13 months ago.

73, Tom

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47. [tacgps] Re: Choke Ring Antenna construction

From: Bob Smith <bobsmith@i2020.net>
Date: Sun, 14 Oct 2001 08:52:04 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41695-2001.10.14-08.17.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug --

I did some looking into the choke ring configurations a few months back. The antenna that you referred to, as I recall, was done by Dr. Clark, W3IWI. Its rings were made from cake forms.

I don't recall where I saw this artical. If you need more information,

email me and I will search my archives.

Bob Smith

Doug Bade wrote:
>
> I recall someone had home brewed a choke ring GPS antenna out of Pie
> plates.. or such .. Does anyone have any experience with a Homemade Antenna
> which would be a good match for the HP Z3801A receivers.. I get a lot of
> ground clutter reflections at my office.. Any thoughts?? I would rather not
> shuck out some bucks for a real commercial one.. 73, Doug KB8GVQ
>
> ---
> You are currently subscribed to tacgps as: bobsmith@i2020.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--

--------- Avoid computer viruses -- Practice safe hex -------------
 * * Specializing in small, cost effective embedded control systems * *
Robert L. (Bob) Smith   Smith Machine Works, Inc.
internet   bobsmith@i2020.net   9900 Lumlay Road
landline   804/745-1065   Richmond, Virginia 23236+1004

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48. [tacgps] RE: Choke Ring

From: "Darryl Smith" <Darryl@radio-active.net.au>
Date: Mon, 15 Oct 2001 19:43:12 +1000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41835-2001.10.15-05.11.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I think you will find that one of the times this was discussed was
December 1998... One of the messages was...

Date: Wed, 02 Dec 1998 05:17:07 +0000
From: "Dr Thomas A Clark (W3IWI)" <tac@clark.net>
To: tacgps@tapr.org
Subject: Re: GPS Antenna design drawings and photos
Message-ID: <3664CD53.65B36ECE@clark.net>

Darryl VK2TDS

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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49. [tacgps] Infoormations on HP GPS receiver Z3816.

From: "Luciano Bollini" <bollinilu@omniway.sm>
Date: Mon, 15 Oct 2001 16:31:35
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41883-2001.10.15-16.57.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I bought an HP GPS receiver Z3816 on EBAY.
Somebody have notice about it.
I would like to know which software it need to communicate with it, or if
it's possible to find an list of reference command.
Thank you very much.
Luciano

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

50. [tacgps] RE:Infoormations on HP GPS receiver Z3816.

From: "Luciano Bollini" <bollinilu@omniway.sm>
Date: Mon, 15 Oct 2001 16:56:52
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41892-2001.10.15-17.22.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Bob,

I have an Z3801A and it is working properly.

I need informations on Z3816 HP GPS receiver, it's different receiver.

Thank you and regards.

Luciano

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

51. [tacgps] Re: Infoormations on HP GPS receiver Z3816.

From: Doug Bade <doug@clecom.com>
Date: Mon, 15 Oct 2001 17:59:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41893-2001.10.15-17.24.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Luciano;

The software you need
is http://www.ohioaprs.net/files/doug/GPS-DSP/satstat.zip

This is the HP communications program.
The port is RS-422 not RS-232. You will find other useful information in
http://www.ohioaprs.net/files/doug/GPS-DSP/
Some setup notes which have been compiled.
And the schematics for a couple RS-422-RS-232 prototypes.

At 04:31 PM 10/15/01 +0000, you wrote:
>I bought an HP GPS receiver Z3816 on EBAY.
>Somebody have notice about it.
>I would like to know which software it need to communicate with it, or if
>it's possible to find an list of reference command.
>Thank you very much.
>Luciano
>
>---
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---
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52. [tacgps] RE:Infoormations on HP GPS receiver Z3816.

From: bobhome@pacbell.net
Date: Mon, 15 Oct 2001 15:40:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41895-2001.10.15-18.05.32--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Best of luck with the 3816 docs... Can you tell me just a bit about the
device? I'm unfamiliar with that model number.

Regards,
Bob

----- Original Message -----
From: "Luciano Bollini" <bollinilu@omniway.sm>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, October 15, 2001 9:56 AM
Subject: [tacgps] RE:Infoormations on HP GPS receiver Z3816.

> Hi Bob,
>
> I have an Z3801A and it is working properly.
>
> I need informations on Z3816 HP GPS receiver, it's different receiver.
>
> Thank you and regards.
>
> Luciano
>
> ---
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>
>

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53. [tacgps] RE: Z3801A back on eBay... Don't bid more than $399... More...

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Mon, 15 Oct 2001 23:04:37 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41915-2001.10.15-22.30.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi, Bob!

I got the units today...they were packed very well and look nice. No chance
to power them up yet.

What are you using for an antenna / preamp?

I saw the web postings on building a helical and using an MMIC. But if
there's an alternative that works well and is even quicker (or purchasable)
I 'd take it.

Thanks for all of your help!

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.qsl.net/w3sz

  -----Original Message-----
  From: bounce-tacgps-23685@lists.tapr.org
[mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of bobhome@pacbell.net
  Sent: Saturday, October 06, 2001 11:23 PM
  To: TAPR Special Interest Group
  Subject: [tacgps] Z3801A back on eBay... Don't bid more than $399...
More...

  Hi folks,

  I spoke with the seller of Z3801A at Buylegacy yesterday and he will sell
these receivers at $399 if you contact him directly. No point bidding more
that the $399 opening bid on eBay!

  contact information: james@zrginc.com

  Regards,
  Bob

54. [tacgps] RE: Z3801A back on eBay... Don't bid more than $399... More...

From: Doug Bade <doug@clecom.com>
Date: Tue, 16 Oct 2001 08:58:59 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41954-2001.10.16-08.19.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Roger;
         I can say that both mine are working from Buylegacy.I am using a

mobile mag mount at office. I think it is made by Antennex . Any 5v high
gain mag-mount or such should work to get started, but an antenna which
blocks below 10 degrees would probably improve timing accuracy/position
establishment. I have about 50 feet of mini 8x feed line, and likely going
to change it to a lower loss cable soon. I am using a splitter and a DC
block to separate antenna for 2 GPS's. I am waiting to get the info from Dr
Clark on his choke ring assembly and try and see if it is better. The 10mhz
osc matches my HP service monitor Hz for Hz out 6 decimal places.

Doug KB8GVQ

At 11:04 PM 10/15/2001 -0400, you wrote:
>Hi, Bob!
>
>I got the units today...they were packed very well and look nice. No
>chance to power them up yet.
>
>What are you using for an antenna / preamp?
>
>I saw the web postings on building a helical and using an MMIC. But if
>there's an alternative that works well and is even quicker (or
>purchasable) I 'd take it.
>
>Thanks for all of your help!
>
>
>73,
>
>Roger Rehr
>W3SZ ex AA3QK, WA3JYM FN20ah
>2 Merrymount Road
>Reading, PA 19609-1718
><http://www.qsl.net/w3sz>http://www.qsl.net/w3sz
>>-----Original Message-----
>>From: bounce-tacgps-23685@lists.tapr.org
>>[mailto:bounce-tacgps-23685@lists.tapr.org]On Behalf Of bobhome@pacbell.net
>>Sent: Saturday, October 06, 2001 11:23 PM
>>To: TAPR Special Interest Group
>>Subject: [tacgps] Z3801A back on eBay... Don't bid more than $399... More...
>>
>>Hi folks,
>>
>>I spoke with the seller of Z3801A at Buylegacy yesterday and he will sell
>>these receivers at $399 if you contact him directly. No point bidding
>>more that the $399 opening bid on eBay!
>>
>>contact information: <mailto:james@zrginc.com>james@zrginc.com
>>
>>Regards,
>>Bob

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55. [tacgps] Z3801A info online?

From: John Ackermann N8UR <jra@febo.com>
Date: Tue, 16 Oct 2001 10:57:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41964-2001.10.16-10.23.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I haven't been able to find any info about the Z3801A online. It doesn't
even show up as a product in HP (Agilent)'s tech support site.

Was this an OEM only unit? Does it directly map to any other HP product?

Just curious -- I'm anxiously waiting for mine to arrive, and was hoping to
do some reading in advance.

John

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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56. [tacgps] Re: Z3801A info online?

From: Doug Bade <doug@clecom.com>
Date: Tue, 16 Oct 2001 11:52:16 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-41976-2001.10.16-11.18.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello John;

I was unable to find info on the unit at HP, but it does come with a manual from Buylegacy. It has no schematics, but fairly complete user info. Other info is being compiled as people make or find it. I created a file area at http://www.ohioaprs.net/files/doug/GPS-DSP/

It is based on another unit which someone alluded to a few posts ago, but it is an OEM special for someone (Sprint maybe?)
It is an ovenized 10mhz clock GPS locked with a precision timing GPS. It has 1PPS outputs and 10 mhz osc ...

Time specification is 1 usec locked, 7 usec unlocked for 24 hours. It uses HP "Smartclock(r) Technology"

If GPS lock is lost... Holdover Frequency is maintained better than <1 X 10 -9 per day.

It has a self survey mode, and requires 24 hours to fully lock..

Basically it technically looks like a Brooks Shera GPS disciplined Oscillator in box that runs on 48vdc self contained.
It even uses a double ovened version of the oven he spec'd in the article (more or less :-))

Doug KB8GVQ

At 10:57 AM 10/16/01 -0400, you wrote:
>I haven't been able to find any info about the Z3801A online. It doesn't
>even show up as a product in HP (Agilent)'s tech support site.
>
>Was this an OEM only unit? Does it directly map to any other HP product?
>
>Just curious -- I'm anxiously waiting for mine to arrive, and was hoping
>to do some reading in advance.
>
>John
>
>----
>John Ackermann N8UR jra@febo.com http://www.febo.com
>President, TAPR n8ur@tapr.org http://www.tapr.org
>
>
>---
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>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

57. [tacgps] Re: Z3801A info online?

From: bobhome@pacbell.net
Date: Tue, 16 Oct 2001 17:50:23 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42057-2001.10.16-20.15.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi John,

A couple minor differences between the Shera clock and Z3801A...

Unlike the Motorola Oncore and numerous other GPS receivers, the Z3801A does not output a time stamp each second. What the Z3801A offers is a time message in response to a status request. This makes for a somewhat different program if you want to run a real time display driven by the clock serial output and 1pps. The 1pps from the Z3801A is also quite short and has no

software length adjustment. Nominal is 50 - 100 uS. You will need to stretch
the pulse if you want to drive a 1pps LED.

The Z3801A has much quicker and simpler initial lockup than the Shera loop.
Brooks' controller requires that you manually step your way up through the N
numbers to the final lock value. The Z3801A comes up in a fast loop to get
close to lock, a much slower loop then automatically takes over to fine-tune
the lock... all without user input. Again, this makes little difference if
your clock runs off a UPS power supply and is restarted every few years.

I've also sent Doug a copy of the Z3801A manual in PDF format as provided by
Symmetricom. This manual is somewhat more recent (and possibly less well
matched to our older receivers!) than that provided by Buylegacy. The manual
should be on Doug's site in the next day or three. Size is just over 1 MB.

Regards,
Bob

.
----- Original Message -----
From: "John Ackermann N8UR" <jra@febo.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, October 16, 2001 7:57 AM
Subject: [tacgps] Z3801A info online?

> I haven't been able to find any info about the Z3801A online. It doesn't
> even show up as a product in HP (Agilent)'s tech support site.
>
> Was this an OEM only unit? Does it directly map to any other HP product?
>
> Just curious -- I'm anxiously waiting for mine to arrive, and was hoping
to
> do some reading in advance.
>
> John
>
> ----
> John Ackermann   N8UR   jra@febo.com   http://www.febo.com
> President, TAPR   n8ur@tapr.org   http://www.tapr.org
>
>
> ---
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>
>

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58. [tacgps] HP Z3801A Manual posted

From: Doug Bade <doug@clecom.com>
Date: Tue, 16 Oct 2001 21:40:37 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: dsp-10@qth.net
Message-ID: <LYR6754-42061-2001.10.16-21.00.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

To those who may be interested...

        I have posted the PDF of the Operator manual as
http://www.ohioaprs.net/files/doug/GPS-DSP/097-z3801-01-iss-1.pdf
for anyone who wants to download it. It is 1MB +_ so it is big.
        Thanks to Bob sending it to me.

This is a little newer than most of the current EBAY units, but should be
close in leu of nothing else.. Doug KB8GVQ

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

59. [tacgps] Choke Ring GPS ANT. Question

From: Doug Bade <doug@clecom.com>
Date: Wed, 17 Oct 2001 12:06:06 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42168-2001.10.17-11.31.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Group;
I am building from my memory and the notes Dr. Clark Recently posted here, a homebrew choke ring GPS antenna. I have assembled the cake pans and duct pans with a utility box(3.5" X 1.5") inside last 4" duct cap. All riveted together with an EMT fitting up the middle. and a flat cover for the box.

The question is... where in the center ass'y between the top of the pan and the bottom of the utility box, do I mount the GPS Antenna. It is mag mount. Do I just stick it to the top of the utility box? or does it need to be higher or lower. The Top of the GPS antenna would be just about flush with the choke ring top's if I stick it to the top of the utility box. If I need to be lower, I do not remember from Dr. Clarks drawings, how the GPS Mag patch antenna mounted.

Anyone who can help, I would appreciate it..Thanks in advance,

BTW if it all works out, I will document ant post files for anyone else who wants to build it. Doug KB8GVQ

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

60. [tacgps] RE: Choke Ring GPS ANT. Question

From: "Dr. Tom Clark" <tac@clark.net>
Date: Wed, 17 Oct 2001 12:46:41 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42174-2001.10.17-12.12.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Yes, just set the mag mount on top of the 4" x 1.5" utility box in the center. The patch antenna will stick up a bit above the plane of the top of the "rings". I actually put a little bit of RTV under the antenna so I wouldn't have to trust the strength of the magnet.

Sure wish aleph was up, 'cuz you could see the photos of what I did.

73, Tom

> -----Original Message-----
> From: bounce-tacgps-25677@lists.tapr.org
> [mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of Doug Bade
> Sent: Wed, October 17, 2001 12:06
> To: TAPR Special Interest Group
> Subject: [tacgps] Choke Ring GPS ANT. Question
>
>
> Hello Group;
> I am building from my memory and the notes Dr. Clark
> Recently posted here,
> a homebrew choke ring GPS antenna. I have assembled the cake pans
> and duct
> pans with a utility box(3.5" X 1.5") inside last 4" duct cap. All riveted
> together with an EMT fitting up the middle. and a flat cover for the box.
>
> The question is... where in the center ass'y between the
> top of the pan
> and the bottom of the utility box, do I mount the GPS Antenna. It is mag
> mount. Do I just stick it to the top of the utility box? or does
> it need to
> be higher or lower. The Top of the GPS antenna would be just about flush
> with the choke ring top's if I stick it to the top of the utility
> box. If I
> need to be lower, I do not remember from Dr. Clarks drawings, how the GPS
> Mag patch antenna mounted.
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

61. [tacgps] RE: Choke Ring GPS ANT. Question

From: Doug Bade <doug@clecom.com>
Date: Wed, 17 Oct 2001 13:19:25 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42182-2001.10.17-12.45.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Dr. Clark;

Thanks for the info. I had printed and studied the docs a couple years ago when we exchanged some email on, i think, this reflector. For the life of me I cannot find the prints I made of the jpg's. I remembered most beyond what you posted a couple days ago, but that piece was lost in memory.. I am setting it up for test, and will see what happens.. Thanks for all Doug KB8GVQ

At 12:46 PM 10/17/01 -0400, you wrote:
>Yes, just set the mag mount on top of the 4" x 1.5" utility box in the
>center. The patch antenna will stick up a bit above the plane of the top of
>the "rings". I actually put a little bit of RTV under the antenna so I
>wouldn't have to trust the strength of the magnet.
>
>Sure wish aleph was up, 'cuz you could see the photos of what I did.
>
>73, Tom

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

62. [tacgps] Re: Choke Ring GPS ANT. Question

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 18 Oct 2001 09:26:45 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42305-2001.10.18-09.52.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

And if it works, we may want to see if Tom or I can test it for phase center, etc., in an anechoic chamber or on a decent range!

gerry
--
Doug Bade wrote:
>
>   Hello Group;
>   I am building from my memory and the notes Dr. Clark Recently posted here,
> a homebrew choke ring GPS antenna. I have assembled the cake pans and duct
> pans with a utility box(3.5" X 1.5") inside last 4" duct cap. All riveted
> together with an EMT fitting up the middle. and a flat cover for the box.
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>   The question is... where in the center ass'y between the top of the pan
> and the bottom of the utility box, do I mount the GPS Antenna. It is mag
> mount. Do I just stick it to the top of the utility box? or does it need to
> be higher or lower. The Top of the GPS antenna would be just about flush
> with the choke ring top's if I stick it to the top of the utility box. If I
> need to be lower, I do not remember from Dr. Clarks drawings, how the GPS
> Mag patch antenna mounted.
>
>   Anyone who can help, I would appreciate it..Thanks in advance,
>
>   BTW if it all works out, I will document ant post files for anyone else
> who wants to build it. Doug KB8GVQ
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

63. [tacgps] Re: Choke Ring GPS ANT. Question

From: Doug Bade <doug@clecom.com>
Date: Thu, 18 Oct 2001 13:04:01 -0400

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42318-2001.10.18-12.29.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry;
That sounds like a real interesting idea... I have parts to build
2 units right now.. I wish to set one up here, but getting another one
tested is ok.. Nasa Glenn Lewis Cleveland has an indoor antenna test
facility.. I just do not know what it takes to get in or how or who to do
this... I know some folks over in the facility, I may see what can be done
here...
The paint is drying right now, but I hope to get it up on the roof in a
couple hours.. I am using a Sigem antenna in the center... ~26db or so, and
about 50 ft of coax into my office. The salad bowl is waiting to be put
over antenna, going up to mount a stub of EMT. Later another report after
connecting to Oncore VP ..... Doug

At 09:26 AM 10/18/01 -0500, you wrote:
>And if it works, we may want to see if Tom or I can test it for phase
>center, etc., in an anechoic chamber or on a decent range!
>
>gerry

>--
>Doug Bade wrote:
> >
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> > I am building from my memory and the notes Dr. Clark Recently
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> > a homebrew choke ring GPS antenna. I have assembled the cake pans and duct
> > pans with a utility box(3.5" X 1.5") inside last 4" duct cap. All riveted
> > together with an EMT fitting up the middle. and a flat cover for the box.
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

64. [tacgps] Re: Choke Ring GPS ANT. Question

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 18 Oct 2001 16:43:23 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42331-2001.10.18-16.40.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If I can get my ducks in a row, I can rough out a test range in about a
week. It won't be perfect, but I've got a couple of Ashtech, and one
Dorne Margolin, choke rings I can use for calibration. I'll talk to the
boss and see what I can do...

gerry
--
Doug Bade wrote:
>
> Gerry;
> That sounds like a real interesting idea... I have parts to build
> 2 units right now.. I wish to set one up here, but getting another one
> tested is ok.. Nasa Glenn Lewis Cleveland has an indoor antenna test
> facility.. I just do not know what it takes to get in or how or who to do
> this... I know some folks over in the facility, I may see what can be done
> here...
> The paint is drying right now, but I hope to get it up on the roof in a
> couple hours.. I am using a Sigem antenna in the center... ~26db or so, and
> about 50 ft of coax into my office. The salad bowl is waiting to be put
> over antenna, going up to mount a stub of EMT. Later another report after
> connecting to Oncore VP ..... Doug
>
> At 09:26 AM 10/18/01 -0500, you wrote:
> >And if it works, we may want to see if Tom or I can test it for phase
> >center, etc., in an anechoic chamber or on a decent range!
> >
> >gerry
>
> >--

> >Doug Bade wrote:
> > >
> > >   Hello Group;
> > >   I am building from my memory and the notes Dr. Clark Recently
> > posted here,
> > > a homebrew choke ring GPS antenna. I have assembled the cake pans and duct
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> > > together with an EMT fitting up the middle. and a flat cover for the box.
> > >
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager
AATLT/Network Engineering
Texas A&M University
979.458.4020 (Phone)   979.847.8578 (FAX)

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65. [tacgps] Re: Choke Ring GPS ANT. Question

From: Jeff <barnie@flash.net>
Date: Sat, 20 Oct 2001 13:08:12 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42610-2001.10.20-15.34.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry:
  Could you (or anyone for that matter) give a reference to a procedure
to use in testing for phase center in a chamber? Maybe a brief description
for the group plus a pointer to more detailed instruction? Thanks,

Jeff

Gerry Creager N5JXS wrote:

> If I can get my ducks in a row, I can rough out a test range in about a
> week. It won't be perfect, but I've got a couple of Ashtech, and one
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> boss and see what I can do...
>
> gerry
> --
> Doug Bade wrote:
> >
> > Gerry;
> >   That sounds like a real interesting idea... I have parts to build
> > 2 units right now.. I wish to set one up here, but getting another one
> > tested is ok.. Nasa Glenn Lewis Cleveland has an indoor antenna test
> > facility.. I just do not know what it takes to get in or how or who to do
> > this... I know some folks over in the facility, I may see what can be done
> > here...
> > The paint is drying right now, but I hope to get it up on the roof in a
> > couple hours.. I am using a Sigem antenna in the center... ~26db or so, and
> > about 50 ft of coax into my office. The salad bowl is waiting to be put
> > over antenna, going up to mount a stub of EMT. Later another report after
> > connecting to Oncore VP ..... Doug
> >
> > At 09:26 AM 10/18/01 -0500, you wrote:
> > >And if it works, we may want to see if Tom or I can test it for phase
> > >center, etc., in an anechoic chamber or on a decent range!
> > >
> > >gerry
> >
> > >--
> > >Doug Bade wrote:
> > > >
> > > >   Hello Group;
> > > >   I am building from my memory and the notes Dr. Clark Recently
> > > posted here,
> > > > a homebrew choke ring GPS antenna. I have assembled the cake pans and duct
> > > > pans with a utility box(3.5" X 1.5") inside last 4" duct cap. All riveted
> > > > together with an EMT fitting up the middle. and a flat cover for the box.
> > > >
> >

> > ---
> > You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
> --
> Gerry Creager
> AATLT/Network Engineering
> Texas A&M University
> 979.458.4020 (Phone)   979.847.8578 (FAX)
>
> ---
> You are currently subscribed to tacgps as: BARNIE@FLASH.NET
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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66. [tacgps] Z3801A and Brooks Shera's GPS controller

From: "W3SZ R Rehr" <r1ehr2@epix.net>
Date: Sat, 20 Oct 2001 22:21:45 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42641-2001.10.20-21.48.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This email has several messages:

1. I got two of the Z3801A's from Buy Legacy and they are VERY nice. Work perfectly, built like only HP could.

2. The Z3801A's got me re-interested in optimizing the high stability frequency standards here, and I decided to finally do what Bob Larkin, Larry Lilqvist, Jimmy W7CQ have recommended; I brought three SPST switches out to the front panel of my Brooks Shera controller so that I could go into setup mode to set Ra and Rb and cycle thru S=1, S=2,...when acquiring lock without opening the case and messing with the dipswitches. Boy does this make a difference!

3. Having optimized Brooks' controller in this fashion and using it with a Motorola Oncore receiver, the TAC-2 and the active Motorola patch antenna sold by TAPR I can say that:

a. I actually get to lock significantly faster with Brooks' unit fed by the TAC-2 than with the Z3801As.

b. The combination of the Motorola Oncore and TAC-2 maintain acquisition with the satellites much more consistently than do the Z3801a's, and with a larger number of satellites in lock at any time.

c. It is nice to have available on screen and in a file a record of what has been going on with the controller. I've got a program that uses Brooks' output and writes it to a file and shows it on the screen...guess I'll need to do the same for the HP's. The HP program shows whats going on now, but I dont think it gives a neverending log file like I have with Brooks' controller.

So I am very pleased with the Z3801A's, but here with my indoor active patch antenna I find that the Oncore/TAC-2/Brooks Shera combination outperforms the HP unit, and with the newly added external switches is easy to use, so I plan to stick with Brooks' controller, with even greater respect for its performance. The Z3801A's will I am sure be put to good use here also, and will serve as back up to Brooks' unit and the Rb standard for now.

Thanks to all for all of their help on all of these projects!

PS as far as the Z3801A's go, I don't yet have my 232/422 converter in hand, so I used the jury rigged link Bob and Doug were kind enough to provide details of. I found that, here at least, "keep it to 3 feet or less" meant just that. Longer lengths of cable didn't work. 3 feet works fine.

73,

Roger Rehr
W3SZ ex AA3QK, WA3JYM FN20ah
2 Merrymount Road
Reading, PA 19609-1718
http://www.qsl.net/w3sz

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

67. [tacgps] Re: Choke Ring GPS ANT. Question

From: "Dr. Tom Clark" <tac@clark.net>
Date: Sat, 20 Oct 2001 23:25:09 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42651-2001.10.20-22.50.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> -----Original Message-----
> From: bounce-tacgps-25677@lists.tapr.org
> [mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of Jeff
> Sent: Sat, October 20, 2001 16:08
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Choke Ring GPS ANT. Question
>
>
> Gerry:
> Could you (or anyone for that matter) give a reference to a procedure
> to use in testing for phase center in a chamber? Maybe a brief
> description
> for the group plus a pointer to more detailed instruction? Thanks,
>
> Jeff

How much detail do you want? There are a number of papers describing the antenna range procedures that Bruce Schupler and I used. The most recent is from last year's ION 2000 conference:

B.R.Schupler and T.A.Clark, "High Accuracy Charactization of Geodetic GPS Antennas Using Anechoic Chamber and Field Tests"; ION GPS-2000 Proceedings CDROM paper #302, Pg 2499 (Inst. of Navigation).

Much of the same material is in a recent issue of GPS World:

Schupler & Clark, "Innovation - Characterizing the Behavior of Geodetic GPS Antennas"; GPS World 12, No.2, Pg 48, 2001

For Historical (Hysterical?) material also try some of these (an incomplete list):

Schupler, B. R. and T. A. Clark, "How different antennas affect the GPS observable", GPS World 2, 32 (1991).

Schupler, B. R., R. L. Allshouse, and T. A. Clark, Signal characteristics of GPS user antennas, Navigation, 41, No. 3, 277-295, 1994.

Schupler, Clark and Allshouse, "Characterizations of GPS User Antennas: Reanalysis and New Results"; GPS Trends in G.Beutler et al "Precise Terrestrial, Airborne and Spaceborne Applications", IAG Symposia V 115, Boulder CO 1995 (Springer Verlag).

Clark, Schupler, Kodak, Allshouse & MacMillan, "GPS Antennas: Towards Improving Our Understanding of Factors Affecting Geodetic Performance"; AGU Spring Meeting 1999; http://www.agu.org/meetings/sm96g.html

Clark, T.A., B. Schupler, C. Kodak, and R. Allshouse, "GPS Antennas: Towards Improving Our Understanding of Factors Affecting Geodetic Performance", Eos Trans. AGU, 77, Fall Meeting Suppl. 1996

If/when the aleph host at NASA/GSFC comes back to life, there are myriad photos, reprints, preprints, data files, etc on it.

73, Tom

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

68. [tacgps] Re: Choke Ring GPS ANT. Question

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Sat, 20 Oct 2001 23:01:42 -0500

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42654-2001.10.20-23.27.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I knew if I waited a little bit, Tom would respond. As the real
acknowledged expert, he's got the citations and experiience to answer
the questions off the topof his head. Most of my answers would cite his
work, anyway, or similar work.

gerry
--
"Dr. Tom Clark" wrote:
>
> > -----Original Message-----
> > From: bounce-tacgps-25677@lists.tapr.org
> > [mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of Jeff
> > Sent: Sat, October 20, 2001 16:08
> > To: TAPR Special Interest Group
> > Subject: [tacgps] Re: Choke Ring GPS ANT. Question
> >
> >
> > Gerry:
> >   Could you (or anyone for that matter) give a reference to a procedure
> > to use in testing for phase center in a chamber? Maybe a brief
> > description
> > for the group plus a pointer to more detailed instruction? Thanks,
> >
> > Jeff
>
> How much detail do you want? There are a number of papers describing the
> antenna range procedures that Bruce Schupler and I used. The most recent is
> from last year's ION 2000 conference:
>
> B.R.Schupler and T.A.Clark, "High Accuracy Charactization of Geodetic GPS
> Antennas Using Anechoic Chamber and Field Tests"; ION GPS-2000 Proceedings
> CDROM paper #302, Pg 2499 (Inst. of Navigation).
>
> Much of the same material is in a recent issue of GPS World:
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> Antennas"; GPS World 12, No.2, Pg 48, 2001
>
> For Historical (Hysterical?) material also try some of these (an incomplete
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>
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> Clark, Schupler, Kodak, Allshouse & MacMillan, "GPS Antennas: Towards
> Improving Our Understanding of Factors Affecting Geodetic Performance"; AGU
> Spring Meeting 1999; http://www.agu.org/meetings/sm96g.html
>
> Clark, T.A., B. Schupler, C. Kodak, and R. Allshouse, "GPS Antennas: Towards
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> Trans. AGU, 77, Fall Meeting Suppl. 1996
>
> If/when the aleph host at NASA/GSFC comes back to life, there are myriad
> photos, reprints, preprints, data files, etc on it.
>
> 73, Tom
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

69. [tacgps] Re: Z3801A and Brooks Shera's GPS controller

From: bobhome@pacbell.net
Date: Sat, 20 Oct 2001 23:16:06 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42682-2001.10.21-01.42.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Roger,

The Shera standard will indeed lock very quickly. I use a 3/4" hole in the Shera case above the internal dip switch with a steel hole plug in place most of the time. I can pop the plug and reach in with a small tool to adjust the dip switch settings at start-up. Once set, I don't need to touch them and the hole plug goes back in place.

As far as maintaining GPS lock, I have a roof mounted antenna (VIC-100) and have yet to loose lock with the Z3801A or Oncore. A decent antenna and sky view eliminate that issue. Lock is very quick with both the Z3801A and Shera using the external antenna.

A small APC UPS for the clocks eliminates all but the most extreme power fail issues.

Good night!

Bob

---- Original Message -----
From: "W3SZ R Rehr" <r1ehr2@epix.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, October 20, 2001 7:21 PM
Subject: [tacgps] Z3801A and Brooks Shera's GPS controller

> This email has several messages:
>
> 1. I got two of the Z3801A's from Buy Legacy and they are VERY nice. Work
> perfectly, built like only HP could.
>
> 2. The Z3801A's got me re-interested in optimizing the high stability
> frequency standards here, and I decided to finally do what Bob Larkin,
Larry
> Lilqvist, Jimmy W7CQ have recommended; I brought three SPST switches out
to
> the front panel of my Brooks Shera controller so that I could go into
setup
> mode to set Ra and Rb and cycle thru S=1, S=2,...when acquiring lock
without
> opening the case and messing with the dipswitches. Boy does this make a
> difference!
>
> 3. Having optimized Brooks' controller in this fashion and using it with a
> Motorola Oncore receiver, the TAC-2 and the active Motorola patch antenna
> sold by TAPR I can say that:
>
> a. I actually get to lock significantly faster with Brooks' unit fed by
the
> TAC-2 than with the Z3801As.
>
> b. The combination of the Motorola Oncore and TAC-2 maintain acquisition
> with the satellites much more consistently than do the Z3801a's, and with
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>
> c. It is nice to have available on screen and in a file a record of what
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I
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> So I am very pleased with the Z3801A's, but here with my indoor active
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> the HP unit, and with the newly added external switches is easy to use, so
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> performance. The Z3801A's will I am sure be put to good use here also,
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> will serve as back up to Brooks' unit and the Rb standard for now.
>
> Thanks to all for all of their help on all of these projects!
>
> PS as far as the Z3801A's go, I don't yet have my 232/422 converter in
hand,
> so I used the jury rigged link Bob and Doug were kind enough to provide
> details of. I found that, here at least, "keep it to 3 feet or less"
meant
> just that. Longer lengths of cable didn't work. 3 feet works fine.
>
> 73,
>
> Roger Rehr
> W3SZ ex AA3QK, WA3JYM FN20ah
> 2 Merrymount Road
> Reading, PA 19609-1718
> http://www.qsl.net/w3sz
>
>
>
> ---
> You are currently subscribed to tacgps as: bobhome@pacbell.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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70. [tacgps] Re: Choke Ring GPS ANT. Question

From: Jeff <barnie@flash.net>
Date: Sun, 21 Oct 2001 08:42:17 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42703-2001.10.21-11.08.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks, Tom, that is just what I was looking for. A thorough response, as
usual!

Jeff

"Dr. Tom Clark" wrote:

>
>
> How much detail do you want? There are a number of papers describing the
> antenna range procedures that Bruce Schupler and I used. The most recent is
> from last year's ION 2000 conference:
>
> B.R.Schupler and T.A.Clark, "High Accuracy Charactization of Geodetic GPS
> Antennas Using Anechoic Chamber and Field Tests"; ION GPS-2000 Proceedings
> CDROM paper #302, Pg 2499 (Inst. of Navigation).
>
> Much of the same material is in a recent issue of GPS World:
>
> Schupler & Clark, "Innovation - Characterizing the Behavior of Geodetic GPS
> Antennas"; GPS World 12, No.2, Pg 48, 2001
>
> For Historical (Hysterical?) material also try some of these (an incomplete
> list):
>
> Schupler, B. R. and T. A. Clark, "How different antennas affect the GPS
> observable", GPS World 2, 32 (1991).
>
> Schupler, B. R., R. L. Allshouse, and T. A. Clark, Signal characteristics of
> GPS user antennas, Navigation, 41, No. 3, 277-295, 1994.
>
> Schupler, Clark and Allshouse, "Characterizations of GPS User Antennas:

> Reanalysis and New Results"; GPS Trends in G.Beutler et al "Precise
> Terrestrial, Airborne and Spaceborne Applications", IAG Symposia V 115,
> Boulder CO 1995 (Springer Verlag).
>
> Clark, Schupler, Kodak, Allshouse & MacMillan, "GPS Antennas: Towards
> Improving Our Understanding of Factors Affecting Geodetic Performance"; AGU
> Spring Meeting 1999; http://www.agu.org/meetings/sm96g.html
>
> Clark, T.A., B. Schupler, C. Kodak, and R. Allshouse, "GPS Antennas: Towards
> Improving Our Understanding of Factors Affecting Geodetic Performance", Eos
> Trans. AGU, 77, Fall Meeting Suppl. 1996
>
> If/when the aleph host at NASA/GSFC comes back to life, there are myriad
> photos, reprints, preprints, data files, etc on it.
>
> 73, Tom
>
> ---
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---
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71. [tacgps] Z3801A Questions...

From: Marc Holdwick <n8kwx@home.com>
Date: Sun, 21 Oct 2001 22:18:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42781-2001.10.21-22.44.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello,

I rove in many of the major VHF contests and have long desired better
frequency accuracy on 10 GHz. I have read Brook Shera's excellent article
with great interest.

It seems that a Z3801A for $399 would be cost effective vs putting together
a Shera GPSDO. ($130 ish for the Oncore, $130 ish for a HP ovenized
oscillator on eBay and rounding up the other parts.) My time has also been
a bit short lately.

Glancing at the Z3801A manual, it says that it will operate in holdover mode
with better than 1x10-9 stability over one day. 10 Hz at 10 GHz would be
wonderful.

I assume that running the unit continuously and then using it in holdover
mode would work well when roving (mobile). I'm sure taking the unit mobile
without disconnecting the antenna would give the unit fits!

Someone mentioned an alternate supplier (james@zrginc.com) of these units.
Are they exactly the same units as the BuyLegacy units (in particular the
supply voltage)? 24v would be a little easier to supply while mobile.

Any suggestions or opinions would be appreciated. I consider myself a
beginner yet in this area.

Thanks,

Marc - N8KWX

PS. I looked at my 2001 HP catalog and it seems like HP has stopped selling
their Ovenized oscillators and their GPSDO lineup. Does anyone know "the
real story"??

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72. [tacgps] Re: Z3801A Questions...

From: John Ackermann N8UR <jra@febo.com>
Date: Mon, 22 Oct 2001 07:58:18 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42839-2001.10.22-07.24.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

X-Mailer: Mulberry/2.1.0 (Win32)
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Transfer-Encoding: 7bit
Content-Disposition: inline

HI Marc --

I suspect that you'd be better off with a good oscillator running off a backup power supply. The problem with the GPS-based clocks is that (I don't think) they'll work properly while in motion... on startup they do a lengthy survey to determine their position to within a few meters (much better than "single shot" GPS accuracy) and then go through a stablization phase to bring the oscillator into lock with GPS. I suspect that all takes more time than you'd want to spend at a rover stop.

On the other hand, just a good oscillator like the HP 10811 units you can find on eBay should hold within parts in 10-10 over a day if you keep them powered consistently and perhaps add some better temperature control (e.g., a styrofoam box). Some protection from shock would be a good thing, too.

Of course, with a stand-alone oscillator you don't have automatically perfect *accuracy*, so you'd need something at home to set the oscillator (a GPS 1pps signal plus a 'scope would get you pretty darn close), but I think the stability would be all you'd hope for.

Hope this helps...

73,
John N8UR
jra@febo.com

--On Sunday, October 21, 2001 10:18 PM -0500 Marc Holdwick <n8kwx@home.com> wrote:

> Hello,
>
> I rove in many of the major VHF contests and have long desired better
> frequency accuracy on 10 GHz. I have read Brook Shera's excellent article
> with great interest.
>
> It seems that a Z3801A for $399 would be cost effective vs putting
> together a Shera GPSDO. ($130 ish for the Oncore, $130 ish for a HP
> ovenized oscillator on eBay and rounding up the other parts.) My time
> has also been a bit short lately.
>
> Glancing at the Z3801A manual, it says that it will operate in holdover
> mode with better than 1x10-9 stability over one day. 10 Hz at 10 GHz
> would be wonderful.
>
> I assume that running the unit continuously and then using it in holdover
> mode would work well when roving (mobile). I'm sure taking the unit
> mobile without disconnecting the antenna would give the unit fits!
>
> Someone mentioned an alternate supplier (james@zrginc.com) of these units.
> Are they exactly the same units as the BuyLegacy units (in particular the
> supply voltage)? 24v would be a little easier to supply while mobile.
>
>
> Any suggestions or opinions would be appreciated. I consider myself a
> beginner yet in this area.
>
> Thanks,
>
> Marc - N8KWX
>
>
> PS. I looked at my 2001 HP catalog and it seems like HP has stopped
> selling their Ovenized oscillators and their GPSDO lineup. Does anyone
> know "the real story"??
>

>
>
>
>
>
>
> ---
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>
>
>

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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73. [tacgps] Re: Z3801A Questions...

From: Doug Bade <doug@clecom.com>
Date: Mon, 22 Oct 2001 11:02:28 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-42860-2001.10.22-10.28.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Marc;

From my observations, The unit was not locking to gps on arrival because it was in position hold at coordinates significantly altered from its home. The 10 Mhz oscillator was however locked in holdover mode at 10.000000 Mhz on arrival check. No indication as to when it was last powered up. The survey mode takes about an Hour or so... I did not clock it exactly. The 10Mhz stabilizes before full position lock survey was done. If you were using it for timing, I would suggest other options, as timing reliability takes 24 hours for setup. However for a 10 mhz clock it stabilized very quickly. If you want exact timing details, I could document, but I have been playing with antenna's on the unit, and comparing repetitive surveys.

I am quite impressed with mine so far, I am getting ready to check it against my NovaTech Rubidium Standard and My Shera Rubidium Standard.

At 10:18 PM 10/21/01 -0500, you wrote:
>Hello,
>
>I rove in many of the major VHF contests and have long desired better
>frequency accuracy on 10 GHz. I have read Brook Shera's excellent article
>with great interest.
>
>It seems that a Z3801A for $399 would be cost effective vs putting together
>a Shera GPSDO. ($130 ish for the Oncore, $130 ish for a HP ovenized
>oscillator on eBay and rounding up the other parts.) My time has also been
>a bit short lately.
>
>Glancing at the Z3801A manual, it says that it will operate in holdover mode
>with better than 1x10-9 stability over one day. 10 Hz at 10 GHz would be
>wonderful.
>
>I assume that running the unit continuously and then using it in holdover
>mode would work well when roving (mobile). I'm sure taking the unit mobile
>without disconnecting the antenna would give the unit fits!
>
>Someone mentioned an alternate supplier (james@zrginc.com) of these units.
>Are they exactly the same units as the BuyLegacy units (in particular the
>supply voltage)? 24v would be a little easier to supply while mobile.
>
>
>Any suggestions or opinions would be appreciated. I consider myself a
>beginner yet in this area.
>
>Thanks,
>

>Marc - N8KWX
>
>
>PS. I looked at my 2001 HP catalog and it seems like HP has stopped selling
>their Ovenized oscillators and their GPSDO lineup. Does anyone know "the
>real story"??
>
>
>
>
>
>
>
>---
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74. [tacgps] Choke Ring Antenna Testing Questions

From: Doug Bade <doug@clecom.com>
Date: Wed, 24 Oct 2001 12:54:04 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43322-2001.10.24-12.20.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello SIG;
	I have constructed the Choke Ring Antenna which Tom Clark described, as best as I can remember, and from his notes in the last few days.... I am seeing some rather large position swings with my Oncore VP in survey mode using SA Watch. Should I construe that if I am having swings in position, that timing is being affected significantly too??? The logged positions are 98% under 2.9 meters, but I have a few traces daily that exceed 10 meters.. for fairly short periods...the 49% number is 2.7 meters.

	I suspect I have some motion in the antenna, as it is a fairly large wind load at this time and we have had a lot of wind lately as well as serious downpours. I am sure these are degrading my surveys, but I have no personal experience to compare how much it may be..... I am planning to re-connect my old mag mount on the roof antenna and try some visual comparisons, to see what differs...

	Because the satellites at low elevations are obscured by the choke rings, would this normally affect the positioning survey as I understand those satellites contribute significantly to the position accuracy???

	I am not a scientist, so if these questions seem trivial, please bear with me as I am trying to understand..

	My HP GPS sync'ed oscillator is reporting GPS pulse to pulse timing shifts of less than 50 usec and sometimes in the high psec's.. is this good readings or bad???
	This last question is relative to other GPS sync'ed oscillators.... Most of the time the timing error reported is less than 10 usec from The internal reference and GPS.

	Signal strengths on the satellites seems higher with the choke ring antenna, than with my old mag mount..They are very close in gain.. I think 24 vs 26 dbm...

	I am comparing the HP GPS Oscillator to a Rubidium standard, and they phase track well into the 1 + hours region at 1 mhz comparison divided from the 10 mhz outputs of both ....

	I am just trying to understand how to interpret quality of data being given by SA Watch on the VP and The HP... which are both connected to the Choke ring antenna and through a 2ghz splitter, with a DC Block on the Oncore side.
	The actual antenna of the Choke Ring is a Sigem 3000 series mag mount... It has in all other uses of mine compared favorably to my Trimble mag mounts and better than some others in un-scientific general location tracking comparisons..

	Any comments about any or all of this would be welcome..

	Thanks for your time, Doug Bade KB8GVQ

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75. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Jeff <barnie@flash.net>
Date: Wed, 24 Oct 2001 12:29:35 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43362-2001.10.24-14.55.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug:
  For a stand-alone position, that is exceptionally good. Maybe too good. I typically
record data for a week or so before I draw any conclusions. What I get with both of my Oncores (v10.0 firmware) is
1. Nighttime is significantly better than daytime.
2. I usually get around 6m for the 95% confidence level with no filters and inverse HDOP
weighting.
3. I too notice great tracking performance for hours at a time (<1m) but then the average
is spoiled by 15 minutes or less of errors exceeding 10m.
4. Running two Oncores, one as master, one as rover in DGPS mode, with corrections
every 1 second, I get <1m in Zero Baseline. (i.e., 1 antenna + splitter). Even in the
Zero Baseline mode, the position data stays VERY constant for fairly long periods
then has the same rather short excursions off. If I were to manually filter out these

jumps, I might see <.2m position error (95%)
5. I have no means to tell if the timing performance has similar jumps like the nav data
does. I am running the Shera controller on a single-oven HP10811 10 Mhz oscillator.
I do not see anything strange in either the phase or DAC data from the controller that

might coincide with the nav jumps.
6. I assume your timing errors were < 50ns, not us, right? Are you aware you will see

a sawtooth error on the 1 PPS from the Oncore due to the way they mark time with their internal
oscillator? You should see errors that ramp up to 200ns or so, then jump back to zero. This
is totally normal and predictable. All the quotes you see on very low timing error have this
"instrumentation" error already removed.

My antenna is a 24x36" ground plane with a Lowe antenna at the center. It is mounted on my
Ham antenna tower about 10' below the top, below my OSCAR antennas. I do believe
these structures above the antenna degrade the performance, but I have yet had the time to
do a careful investigation.
  By the way, how are you getting 98% data? My copy of SA Watch only calculates 99% and
95%.

Jeff Vollin
barnie@flash.net

Doug Bade wrote:

> Hello SIG;
>   I have constructed the Choke Ring Antenna which Tom Clark described, as
> best as I can remember, and from his notes in the last few days.... I am
> seeing some rather large position swings with my Oncore VP in survey mode
> using SA Watch. Should I construe that if I am having swings in position,
> that timing is being affected significantly too??? The logged positions are
> 98% under 2.9 meters, but I have a few traces daily that exceed 10 meters..
> for fairly short periods...the 49% number is 2.7 meters.
>
>   I suspect I have some motion in the antenna, as it is a fairly large wind
> load at this time and we have had a lot of wind lately as well as serious
> downpours. I am sure these are degrading my surveys, but I have no personal
> experience to compare how much it may be..... I am planning to re-connect
> my old mag mount on the roof antenna and try some visual comparisons, to
> see what differs...
>

> Because the satellites at low elevations are obscured by the choke rings,
> would this normally affect the positioning survey as I understand those
> satellites contribute significantly to the position accuracy???
>
> I am not a scientist, so if these questions seem trivial, please bear with
> me as I am trying to understand..
>
> My HP GPS sync'ed oscillator is reporting GPS pulse to pulse timing shifts
> of less than 50 usec and sometimes in the high psec's.. is this good
> readings or bad???
> This last question is relative to other GPS sync'ed oscillators.... Most
> of the time the timing error reported is less than 10 usec from The
> internal reference and GPS.
>
> Signal strengths on the satellites seems higher with the choke ring
> antenna, than with my old mag mount..They are very close in gain.. I think
> 24 vs 26 dbm...
>
> I am comparing the HP GPS Oscillator to a Rubidium standard, and they
> phase track well into the 1 + hours region at 1 mhz comparison divided from
> the 10 mhz outputs of both ....
>
> I am just trying to understand how to interpret quality of data being
> given by SA Watch on the VP and The HP... which are both connected to the
> Choke ring antenna and through a 2ghz splitter, with a DC Block on the
> Oncore side.
> The actual antenna of the Choke Ring is a Sigem 3000 series mag mount...
> It has in all other uses of mine compared favorably to my Trimble mag
> mounts and better than some others in un-scientific general location
> tracking comparisons..
>
> Any comments about any or all of this would be welcome..
>
> Thanks for your time, Doug Bade KB8GVQ
>
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76. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Doug Bade <doug@clecom.com>
Date: Wed, 24 Oct 2001 16:15:45 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43366-2001.10.24-15.42.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks for responding Jeff;

The SA Watch survey has been running for 36 Hours, I had reset it after
running 3 days on the prior run... with very similar results, and a
slightly different average position determined.. (within a meter or so) I
will keep it running..

At 12:29 PM 10/24/01 -0700, you wrote:
>Doug:
> For a stand-alone position, that is exceptionally good. Maybe too good. I
>typically
>record data for a week or so before I draw any conclusions. What I get
>with both
>of my Oncores (v10.0 firmware) is
>1. Nighttime is significantly better than daytime.
>2. I usually get around 6m for the 95% confidence level with no filters
>and inverse
>HDOP
>weighting.

My settings correspond to yours..... I was using MA Time not ALL Time... My
all time 99% 8.5m 95% is 6.6m 68% 3.7m 50 % =2.8m

>3. I too notice great tracking performance for hours at a time (<1m) but
>then the

>average
>is spoiled by 15 minutes or less of errors exceeding 10m.

After 36 Hours I can see 9 traces that exceeded 7.5m ring. Some were out
and back real quick, a couple were somewhat lengthy stays.. :-).

>4. Running two Oncores, one as master, one as rover in DGPS mode, with
>corrections
>every 1 second, I get <1m in Zero Baseline. (i.e., 1 antenna +
>splitter). Even in
>the
>Zero Baseline mode, the position data stays VERY constant for fairly long
>periods
>then has the same rather short excursions off. If I were to manually
>filter out these
>
>jumps, I might see <.2m position error (95%)
>5. I have no means to tell if the timing performance has similar jumps
>like the nav
>data
>does. I am running the Shera controller on a single-oven HP10811 10 Mhz
>oscillator.
>I do not see anything strange in either the phase or DAC data from the
>controller that
>
>might coincide with the nav jumps.

>6. I assume your timing errors were < 50ns, not us, right? Are you aware
>you will see
>
>a sawtooth error on the 1 PPS from the Oncore due to the way they mark
>time with their
>internal
>oscillator? You should see errors that ramp up to 200ns or so, then jump
>back to
>zero. This
>is totally normal and predictable. All the quotes you see on very low
>timing error
>have this
>"instrumentation" error already removed.
         Yes I did mean <50ns and typical less than 10, with some next
order pico second readings at times...

         Apparently the HP Z3801A software or hardware removes the larger
error you mention, as I have never seen it.. Each pulse update in their
monitor software has a new time stamp relative to GPS/Oscillator. As I
assume the HP oven (a modified 10811) is not causing these short term
jitters, I assume it was GPS...

See above clarification, sorry I read the wrong line. My I-Opener makes a
good monitor with a couple usb serial ports...

>   By the way, how are you getting 98% data? My copy of SA Watch only
> calculates 99%
>and
>95%.
>
>Jeff Vollin
>barnie@flash.net

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77. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 24 Oct 2001 16:23:40 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43369-2001.10.24-16.49.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug Bade wrote:
>
> Thanks for responding Jeff;

>
> The SA Watch survey has been running for 36 Hours, I had reset it after
> running 3 days on the prior run... with very similar results, and a
> slightly different average position determined.. (within a meter or so) I
> will keep it running..
>
> At 12:29 PM 10/24/01 -0700, you wrote:
> >Doug:
> >   For a stand-alone position, that is exceptionally good. Maybe too good. I
> >typically
> >record data for a week or so before I draw any conclusions. What I get
> >with both
> >of my Oncores (v10.0 firmware) is
> >1. Nighttime is significantly better than daytime.

Ionospheric scintillation. Without dual-frquency, (L1/L2) one cannot
ascertain the magnitude of of the scintillation interaction. We see
similar issues with increases in water vapor.

> >2. I usually get around 6m for the 95% confidence level with no filters
> >and inverse
> >HDOP
> >weighting.
>
> My settings correspond to yours..... I was using MA Time not ALL Time... My
> all time 99% 8.5m 95% is 6.6m 68% 3.7m 50 % =2.8m
>
> >3. I too notice great tracking performance for hours at a time (<1m) but
> >then the
> >average
> >is spoiled by 15 minutes or less of errors exceeding 10m.

Geometry?

> After 36 Hours I can see 9 traces that exceeded 7.5m ring. Some were out
> and back real quick, a couple were somewhat lengthy stays.. :-).

Geometry, vehicle-induced multipath?

> >4. Running two Oncores, one as master, one as rover in DGPS mode, with
> >corrections
> >every 1 second, I get <1m in Zero Baseline. (i.e., 1 antenna +
> >splitter). Even in
> >the
> >Zero Baseline mode, the position data stays VERY constant for fairly long
> >periods
> >then has the same rather short excursions off. If I were to manually
> >filter out these
> >jumps, I might see <.2m position error (95%)

About right.

73, gerry
--
Gerry Creager
AATLT/Network Engineering
Texas A&M University
979.458.4020 (Phone)   979.847.8578 (FAX)

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78. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Doug Bade <doug@clecom.com>
Date: Wed, 24 Oct 2001 18:09:48 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43384-2001.10.24-17.35.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Gerry and SIG;

         That was one of my questions, would a choke ring, which tends to
by design, block lower satellites affect positioning, as these sats are
important to positioning?
Is the trade-off for positioning for timing what I am seeing with this
choke ring antenna? Is there a trade-off???

         If horizontal positioning is shown to be fluctuating in a

stationary GPS, would this also necessarily cause timing errors?

         Could physical oscillation of the antenna assembly due to wind
motion cause distortion in GPS time/position?.. specifically in the mm -
cm range of motion.. not feet or anything.. Oscillation is a better
description.. very slight quick motion....or would these motions be so
small as to be ignored...

         Why I ask is my Choke Ring is on a 4 foot tripod on the roof, and
the salad bowl cover is about 18 inches at the widest part... pretty large
wind load on 6" of lower supported steel 1/2" EMT...

         I guess the question is... In a stationary position, with a Choke
Ring style antenna, what kind of positional information would be normal??
Not GPS Locked , but in 3D mode will a better antenna reduce that error and
will that reduction imply a reduction in timing error as well??

Doug KB8GVQ

At 04:23 PM 10/24/01 -0500, you wrote:
>Doug Bade wrote:
> >
> > Thanks for responding Jeff;
> >
> > The SA Watch survey has been running for 36 Hours, I had reset it after
> > running 3 days on the prior run... with very similar results, and a
> > slightly different average position determined.. (within a meter or so) I
> > will keep it running..
> >
> > At 12:29 PM 10/24/01 -0700, you wrote:
> > >Doug:
> > >   For a stand-alone position, that is exceptionally good. Maybe too
> good. I
> > >typically
> > >record data for a week or so before I draw any conclusions. What I get
> > >with both
> > >of my Oncores (v10.0 firmware) is
> > >1. Nighttime is significantly better than daytime.
>
>Ionospheric scintillation. Without dual-frquency, (L1/L2) one cannot
>ascertain the magnitude of of the scintillation interaction. We see
>similar issues with increases in water vapor.
>
> > >2. I usually get around 6m for the 95% confidence level with no filters
> > >and inverse
> > >HDOP
> > >weighting.
> >
> > My settings correspond to yours..... I was using MA Time not ALL Time... My
> > all time 99% 8.5m 95% is 6.6m 68% 3.7m 50 % =2.8m
> >
> > >3. I too notice great tracking performance for hours at a time (<1m) but
> > >then the
> > >average
> > >is spoiled by 15 minutes or less of errors exceeding 10m.
>
>Geometry?
>
> > After 36 Hours I can see 9 traces that exceeded 7.5m ring. Some were out
> > and back real quick, a couple were somewhat lengthy stays.. :-).
>
>Geometry, vehicle-induced multipath?
>
> > >4. Running two Oncores, one as master, one as rover in DGPS mode, with
> > >corrections
> > >every 1 second, I get <1m in Zero Baseline. (i.e., 1 antenna +
> > >splitter). Even in
> > >the
> > >Zero Baseline mode, the position data stays VERY constant for fairly long
> > >periods
> > >then has the same rather short excursions off. If I were to manually
> > >filter out these
> > >jumps, I might see <.2m position error (95%)
>
>About right.
>
>73, gerry

>--
>Gerry Creager
>AATLT/Network Engineering
>Texas A&M University
>979.458.4020 (Phone)   979.847.8578 (FAX)

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79. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Wed, 24 Oct 2001 18:21:09 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43395-2001.10.24-18.46.39--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug Bade wrote:
>
> Hello Gerry and SIG;
>
>   That was one of my questions, would a choke ring, which tends to
> by design, block lower satellites affect positioning, as these sats are
> important to positioning?
> Is the trade-off for positioning for timing what I am seeing with this
> choke ring antenna? Is there a trade-off???

The predisposition to block lower elevation satellites is based on the
location of the antenna with regard to the rings. If it's at the same
level, or slightly above the top of the rings, it will not tend to chop
off as much elevation; below the level of the rings' top, well, you're
in a hole and cannot see the horizon.

In general terms, we look at satellites above 15-20 degrees for geodetic
work. I suspect, unless your antenna is positioned 'way down, is still
going to be a valid angle, but there are potentially are some refraction
and defraction issues with the intter rings WRT the antenna.

If you've got real satellite visibility 15 + degrees above the horizon,
you should not have an issue with positioning.

One thing to consider: the cutoff angle is to reduce the potential for
making the signal traverse the major vector of atmosphere, where the
lack of L1 correlation can cause some real problems.

>   If horizontal positioning is shown to be fluctuating in a
> stationary GPS, would this also necessarily cause timing errors?

in code-phase, more likely the scenario is that timing errors are
causing positioning errors. Think Multipath here.

>   Could physical oscillation of the antenna assembly due to wind
> motion cause distortion in GPS time/position?.. specifically in the mm -
> cm range of motion.. not feet or anything.. Oscillation is a better
> description.. very slight quick motion....or would these motions be so
> small as to be ignored...

Yes. That could cause some problems.

>   Why I ask is my Choke Ring is on a 4 foot tripod on the roof, and
> the salad bowl cover is about 18 inches at the widest part... pretty large
> wind load on 6" of lower supported steel 1/2" EMT...
>
>   I guess the question is... In a stationary position, with a Choke
> Ring style antenna, what kind of positional information would be normal??
> Not GPS Locked , but in 3D mode will a better antenna reduce that error and
> will that reduction imply a reduction in timing error as well??
This trick question requires a bit of time in the chamber to calibrate
the antenna and use of a real low-noise receiver.

73, gerry
--
Gerry Creager
AATLT/Network Engineering
Texas A&M University
979.458.4020 (Phone)   979.847.8578 (FAX)

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80. [tacgps] Re: Choke Ring Antenna Testing Questions

From: Doug Bade <doug@clecom.com>
Date: Thu, 25 Oct 2001 10:51:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43492-2001.10.25-10.20.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Gerry and Sig;

Thanks again for your reply, I think I might try adjusting the depth of the antenna element in the center of the Choke ring, and see if my antenna construction is contributing to the multi-path problem, which appears to be happening, or if it is more my location in a light industrial area. I am going to build a second unit and run comparisons as I have 2 Oncore VP's.
The Tac 32 signal strength bars do show down to 10 degree's and below but do start to look noticeably attenuated compared to the higher mid elevation sats. The mag mount antenna top is just above flush with the choke rings, I may try another model of mag mount which is a little taller and see if noticeable difference is visible..

I will see what I can do to firm up the mount structure to reduce movement. I will be building the second antenna later today ...

A more formal evaluation would be very interesting if we can.
Thanks, Doug

>>Doug Bade wrote:
>> >
>> > Hello Gerry and SIG;
>> >
>> > That was one of my questions, would a choke ring, which tends to
>> > by design, block lower satellites affect positioning, as these sats are
>> > important to positioning?
>> > Is the trade-off for positioning for timing what I am seeing with this
>> > choke ring antenna? Is there a trade-off???
>>
>>The predisposition to block lower elevation satellites is based on the
>>location of the antenna with regard to the rings. If it's at the same
>>level, or slightly above the top of the rings, it will not tend to chop
>>off as much elevation; below the level of the rings' top, well, you're
>>in a hole and cannot see the horizon.
>>
>>In general terms, we look at satellites above 15-20 degrees for geodetic
>>work. I suspect, unless your antenna is positioned 'way down, is still
>>going to be a valid angle, but there are potentially are some refraction
>>and defraction issues with the intter rings WRT the antenna.
>>
>>If you've got real satellite visibility 15 + degrees above the horizon,
>>you should not have an issue with positioning.
>>
>>One thing to consider: the cutoff angle is to reduce the potential for
>>making the signal traverse the major vector of atmosphere, where the
>>lack of L1 correlation can cause some real problems.
>>
>> > If horizontal positioning is shown to be fluctuating in a
>> > stationary GPS, would this also necessarily cause timing errors?
>>
>>in code-phase, more likely the scenario is that timing errors are
>>causing positioning errors. Think Multipath here.
>>
>> > Could physical oscillation of the antenna assembly due to wind
>> > motion cause distortion in GPS time/position?.. specifically in the mm -
>> > cm range of motion.. not feet or anything.. Oscillation is a better
>> > description.. very slight quick motion....or would these motions be so
>> > small as to be ignored...
>>
>>Yes. That could cause some problems.
>>
>> > Why I ask is my Choke Ring is on a 4 foot tripod on the roof, and
>> > the salad bowl cover is about 18 inches at the widest part... pretty large
>> > wind load on 6" of lower supported steel 1/2" EMT...
>> >
>> > I guess the question is... In a stationary position, with a Choke

>> > Ring style antenna, what kind of positional information would be normal??
>> > Not GPS Locked , but in 3D mode will a better antenna reduce that
>> error and
>> > will that reduction imply a reduction in timing error as well??
>>This trick question requires a bit of time in the chamber to calibrate
>>the antenna and use of a real low-noise receiver.
>>
>>73, gerry
>>--
>>Gerry Creager
>>AATLT/Network Engineering
>>Texas A&M University
>>979.458.4020 (Phone)   979.847.8578 (FAX)

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81. [tacgps] New on this List

From: Joe Reynolds <joseph@la.unm.edu>
Date: Thu, 25 Oct 2001 17:19:29 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43554-2001.10.25-18.41.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello! Everyone:

I hope I'm not off base asking about the GPS Frequency Standard project,
if it still exists. If I'm off topic, Sorry. But, could someone send
me Tom Clark's email address?

I'm doing some Radio Astronomy stuff and could really use a Frequency
Standard based on the NIST's Cesium Fountain Atomic Clock.

Joe Reynolds
ms436, Group NIS-2
Los Alamos National Laboratory
Los Alamos, NM 87544

(505) 667-7900 Fenton Hill Observatory
josephr@lanl.gov

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82. [tacgps] Re: New on this List

From: Richard Ames <richard@linsup.com>
Date: Fri, 26 Oct 2001 10:44:52 +1000 (EST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: TAPR Special Interest Group <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43578-2001.10.25-20.11.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Thu, 25 Oct 2001, Joe Reynolds wrote:

> I hope I'm not off base asking about the GPS Frequency Standard project,

Your on topic and there was a post about some new development work a month
or two back.

I seem to remember a new GPS reciever being used and a replacement to the
TAC?

--
Richard Ames
linsup.com, Sydney, Australia

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83. [tacgps] HP 10811-60111 wanted

From: Ian Roberts <ITR@nanoteq.com>
Date: Fri, 26 Oct 2001 10:13:31 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-43646-2001.10.26-03.42.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm looking for one of these to use in a GPS project.

If someone has a spare could they please contact me direct.

Thanks,
Ian.

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84. [tacgps] Re: Choke Ring Antenna Testing Questions

From: "Dr. Tom Clark" <tac@clark.net>
Date: Mon, 29 Oct 2001 21:51:57 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44311-2001.10.29-21.19.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Many of you were asking about the photos of my choke ring antenna. The aleph
host at NASA/GSFC is back up as of today, and the photos can be seen at

    ftp://aleph.gsfc.nasa.gov/GPS/antennas/

73, Tom

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November 2001

Original source file: tacgps.0111
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0111

1. [tacgps] Two GPS antenna questions`

From: "John R. Ackermann" <jra@febo.com>
Date: Fri, 02 Nov 2001 14:58:16 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44858-2001.11.02-14.24.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

1. I have an *old* Motorola "hockey puck" antenna (the one shipped with
the original PVT-6 eval kit). I've never been clear whether it wants/needs
a groundplane. I'm about to reinstall it at our new house, and the
simplest mounting I can come up with is to stick the thing on a 4 inch
diameter steel pipe flange, which is mounted to a piece of PVC and then
strapped to a vent pipe on the roof. Should I worry about providing any
additional groundplane for this antenna?

2. Any ideas about affordable GPS antenna splitters? I'd ideally like to
be able to drive four receivers from this antenna (2 will do in a pinch).

Thanks,

John N8UR
jra@febo.com

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2. [tacgps] Re: Two GPS antenna questions`

From: Doug Bade <doug@clecom.com>
Date: Fri, 02 Nov 2001 15:19:25 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44860-2001.11.02-14.45.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I bought a splitter from the dss world, 2 way and added a RS DC block on
one side. Just need to connect a GPS to the dc blocked side which does not
need continuity load to initialize.. The PLUS type may make too high of DC
voltage, I have not tested, but just a plain old 2 gig splitter from the
local tv shop worked.. Doug

At 02:58 PM 11/2/01 -0500, you wrote:
>1. I have an *old* Motorola "hockey puck" antenna (the one shipped with
>the original PVT-6 eval kit). I've never been clear whether it
>wants/needs a groundplane. I'm about to reinstall it at our new house,
>and the simplest mounting I can come up with is to stick the thing on a 4
>inch diameter steel pipe flange, which is mounted to a piece of PVC and
>then strapped to a vent pipe on the roof. Should I worry about providing
>any additional groundplane for this antenna?
>
>2. Any ideas about affordable GPS antenna splitters? I'd ideally like to
>be able to drive four receivers from this antenna (2 will do in a pinch).
>
>Thanks,
>
>John N8UR
>jra@febo.com
>
>
>---
>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
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3. [tacgps] Re: Two GPS antenna questions`

From: randy@synergy-gps.com
Date: Fri, 2 Nov 2001 12:20:42 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44862-2001.11.02-14.47.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John,

The old hockey puck will work just fine without a groundplane, there
is actually a pretty good sized groundplane internally in the form of
the PC board. Placing additional ground plane underneath will help
increase S/N ratio a little, but short of building up some sort of a
choke ring affair for precision timing, there probably isn't a major
need for additional plane material.

Brooke Clark (also a denizen of this list, I think) has an
interesting design on his web site that uses some standard satellite
TV components from Radio Shack. I haven't tried building one, but the
splitter and Amplifier are only 10-13 dollars apiece, so it is
certainly worth a look.

http://www.pacificsites.com/~brooke/4GPS.shtml

Randy Warner
Senior Applications Engineer

-------- Original Message --------

> 1. I have an *old* Motorola "hockey puck" antenna (the one shipped
> with the original PVT-6 eval kit). I've never been clear whether it
> wants/needs a groundplane. I'm about to reinstall it at our new
> house, and the simplest mounting I can come up with is to stick the
> thing on a 4 inch diameter steel pipe flange, which is mounted to a
> piece of PVC and then strapped to a vent pipe on the roof. Should I
> worry about providing any additional groundplane for this antenna?
>
> 2. Any ideas about affordable GPS antenna splitters? I'd ideally
> like to be able to drive four receivers from this antenna (2 will do
> in a pinch).
>
> Thanks,
>
> John N8UR
> jra@febo.com
>
>
> ---
> You are currently subscribed to tacgps as: randy@synergy-gps.com
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>
>

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Voice (858) 566-0666 Toll Free 888 479-6749
  Fax (858) 566-0768 Web Site http://www.synergy-gps.com
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4. [tacgps] Re: Two GPS antenna questions`

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Fri, 2 Nov 2001 21:53:52 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44917-2001.11.02-22.22.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

DSS splitters should work well - most are designed to pass DC on one port
and block on the other. DBS uses 950 to 1500 Mhz as a IF and most splitters
designed for satellite work go to 2 Ghz.

Stay away from any powered version. DBS use +13 and +18 volts to command
the LNB to switch polarities.

> ----------

> From: Doug Bade[SMTP:doug@clecom.com]
> Reply To: TAPR Special Interest Group
> Sent: Friday, November 02, 2001 2:19 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Two GPS antenna questions`
>
> I bought a splitter from the dss world, 2 way and added a RS DC block on
> one side. Just need to connect a GPS to the dc blocked side which does not
>
> need continuity load to initialize.. The PLUS type may make too high of DC
>
> voltage, I have not tested, but just a plain old 2 gig splitter from the
> local tv shop worked.. Doug
>
>
>
> At 02:58 PM 11/2/01 -0500, you wrote:
> >1. I have an *old* Motorola "hockey puck" antenna (the one shipped with
> >the original PVT-6 eval kit). I've never been clear whether it
> >wants/needs a groundplane. I'm about to reinstall it at our new house,
> >and the simplest mounting I can come up with is to stick the thing on a 4
>
> >inch diameter steel pipe flange, which is mounted to a piece of PVC and
> >then strapped to a vent pipe on the roof. Should I worry about providing
>
> >any additional groundplane for this antenna?
> >
> >2. Any ideas about affordable GPS antenna splitters? I'd ideally like
> to
> >be able to drive four receivers from this antenna (2 will do in a pinch).
> >
> >Thanks,
> >
> >John N8UR
> >jra@febo.com
> >
> >
> >---
> >You are currently subscribed to tacgps as: DOUG@CLECOM.COM
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
> ---
> You are currently subscribed to tacgps as: brian.kirby@msfc.nasa.gov
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

5. [tacgps] Two GPS antenna questions

From: "Darryl Smith" <Darryl@radio-active.net.au>
Date: Sat, 3 Nov 2001 17:26:29 +1100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-44936-2001.11.03-00.56.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John

The design I saw on a WWW site involves connecting an External antenna
to a GPS. Then add a splitter to a DC blocked antenna INSIDE. This
antenna will be powered by the incoming signal and become a re-radiator.
You might get better performance by actually adding a signal amplifier
just before the transmitting antenna (MAR-6 Amplifier).

Darryl

Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
Mobile Number 0412 929 634 [+61 4 12 929 634 International]
Darryl@radio-active.net.au | www.radio-active.net.au for domain names

---
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6. [tacgps] Re: tacgps digest: November 03, 2001

From: Brooke Clarke <brooke@pacific.net>
Date: Sat, 03 Nov 2001 21:44:19 -0800

To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-45125-2001.11.04-00.11.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi:

Instead of making an amplifier, just use a Satellite coax amp from Radio Shack.
See the 4-way multicoupler for part numbers.
http://www.pacificsites.com/~brooke/4GPS.shtml

73,

Brooke, N6GCE

TAPR Special Interest Group digest wrote:

> TAPR Special Interest Group Digest for Saturday, November 03, 2001.
>
> 1. Two GPS antenna questions
>
> --
>
> Subject: Two GPS antenna questions
> From: "Darryl Smith" <Darryl@radio-active.net.au>
> Date: Sat, 3 Nov 2001 17:26:29 +1100
> X-Message-Number: 1
>
> John
>
> The design I saw on a WWW site involves connecting an External antenna
> to a GPS. Then add a splitter to a DC blocked antenna INSIDE. This
> antenna will be powered by the incoming signal and become a re-radiator.
> You might get better performance by actually adding a signal amplifier
> just before the transmitting antenna (MAR-6 Amplifier).
>
> Darryl
>
> ---------
> Darryl Smith, VK2TDS   POBox 169 Ingleburn NSW 2565 Australia
> Mobile Number 0412 929 634 [+61 4 12 929 634 International]
> Darryl@radio-active.net.au | www.radio-active.net.au for domain names
>
> ---
>
> END OF DIGEST
>
> ---
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---
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7. [tacgps] Rack panel for Z3801A?

From: "John R. Ackermann" <jra@febo.com>
Date: Sun, 04 Nov 2001 12:25:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-45188-2001.11.04-11.52.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Anyone found a reasonably priced rack panel in which to mount the Z3801A?
>From the manual it appears that the unit is in a telco standard half-width
module, but I'm not sure where to look for a matching panel.

John

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8. [tacgps] TAC-2 PCB Preliminary Voltage Checks

From: Gary J Myers <gary@geekslounge.com>
Date: Sun, 04 Nov 2001 15:25:07 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-45232-2001.11.04-17.50.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello All,

I am building a TAC-2 using a direct 5 volt power source. I am doing
voltage checks on the IC sockets; I am measuring + 5 volts at pin 16 of
U2 and not seeing any voltage. If I am doing this right the + side of my
meter is at pin 16 the negative side at pin 8.

The other 14 pin IC sockets, U1, U3 and U4 measure +5 volts as expected.
The + side of my meter @pin 14, negative @pin 7. Is the the wrong way or
is there a way to trace the voltage to U2 to see where the problem
resides?

Gary

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9. [tacgps] Re: TAC-2 PCB Preliminary Voltage Checks

From: "W5SNX" <w5snx@atl.mediaone.net>
Date: Sun, 4 Nov 2001 23:45:32 -0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-45235-2001.11.04-18.12.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gary, the gnd pin for U2 is pin 15. Pin 8 is an input. This is a special
purpose IC and has non standard pin arrangement. Look at sheet 1 of 5 of the
RS232 I/O drawings supplied with the kit. 73 Dick.

----- Original Message -----
From: "Gary J Myers" <gary@geekslounge.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, November 04, 2001 23:25
Subject: [tacgps] TAC-2 PCB Preliminary Voltage Checks

> Hello All,
>
> I am building a TAC-2 using a direct 5 volt power source. I am doing
> voltage checks on the IC sockets; I am measuring + 5 volts at pin 16 of
> U2 and not seeing any voltage. If I am doing this right the + side of my
> meter is at pin 16 the negative side at pin 8.
>
> The other 14 pin IC sockets, U1, U3 and U4 measure +5 volts as expected.
> The + side of my meter @pin 14, negative @pin 7. Is the the wrong way or
> is there a way to trace the voltage to U2 to see where the problem
> resides?
>
> Gary
>
>
> ---
> You are currently subscribed to tacgps as: w5snx@atl.mediaone.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Marconi AllStar 12

From: Doug Bade <doug@clecom.com>
Date: Tue, 13 Nov 2001 16:33:29 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46600-2001.11.13-16.01.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am in need of connection info and preferably a user manual for a Marconi
AllStar 12 GPS receiver. The links sent to me for Marconi.ca documentation
appear to be unavailable. If any one has a PDF or can tell me where to get
a manual I would appreciate it.. Thanks,

If anyone is interested in more of these, there is a seller with about 350+
available, pretty cheap. Doug

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

11. [tacgps] CMC Allstar

From: "Dr. Tom Clark" <tac@clark.net>
Date: Tue, 13 Nov 2001 23:39:05 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "Rick Hambly" <rick@cnssys.com>
Message-ID: <LYR6754-46645-2001.11.13-23.06.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Between Rick and I, it is highly likely that we have paper copies of the CMC documentation for the Allstar. Some versions have the power/IO connector with 0.1" pin spacing, while some of the later versions were smaller and have connector with pins on a 2mm grid. All are nice in having their xtal be a neat, clean 10.000000 MHz.

Some info on the Allstar can be gleaned from
http://www.navtechgps.com/supply/cmcallst.asp
CMC has a large number of versions of their firmware. Some supported 2, 5 or 10 Hz phase measurements, some only 1 Hz rate, while some had no phase measurements. Some had code to be a DGPS base station, most didn't. Some various breeds of the receiver cost anywhere from $175 to $2000 from NavtechGPS, with the only difference being the firmware loaded into them. So be careful to know what you're getting!

BTW, I believe that Rick's TAC32 supports at least some of the Allstar receivers.

73, de Tom, W3IWI

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] Re: Marconi AllStar 12

From: "W. D." <WD@US-Webmasters.com>
Date: Tue, 13 Nov 2001 22:58:02 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46648-2001.11.13-23.25.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

At 15:33 11/13/2001, Doug Bade, wrote:
> I am in need of connection info and preferably a user manual for a Marconi
>AllStar 12 GPS receiver. The links sent to me for Marconi.ca documentation
>appear to be unavailable. If any one has a PDF or can tell me where to get
>a manual I would appreciate it.. Thanks,

http://MakeAshorterLink.com/?Z5A22592

http://www.cmcelectronics.ca/products-services/custom-elect/930-600018-000.pdf

http://www.Google.com/search?q=Marconi+AllStar+12+GPS+receiver+user+manual
>
>If anyone is interested in more of these, there is a seller with about 350+
>available, pretty cheap. Doug

Who, where & how much?

Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] Re: CMC Allstar

From: Doug Bade <doug@clecom.com>
Date: Wed, 14 Nov 2001 10:35:28 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46697-2001.11.14-10.02.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks to all who sent help and links to the manual. I am in the process of connecting it up to my tac-2 board.
The seller was listing on Ebay about a month ago. I emailed him asking if I could post his email to this Sig.. I will likely have an answer

later today.

There are several numbers on the unit if anyone can Identify them.

These are on various labels;

VAR901
RL98252994
265-613939-011
614219-004
Vers.001

They have rechargeable memory battery, and have 20 pin 90 degree header on end of board.

He also has 8 and 12 ch Trimble DSM boards, part number 27354.30, as well as some sk8 's

I let you all know how it goes.. Doug KB8GVQ

At 11:39 PM 11/13/01 -0500, Dr. Tom Clark wrote:
>Between Rick and I, it is highly likely that we have paper copies of the CMC
>documentation for the Allstar. Some versions have the power/IO connector
>with 0.1" pin spacing, while some of the later versions were smaller and
>have connector with pins on a 2mm grid. All are nice in having their xtal be
>a neat, clean 10.000000 MHz.
>
>Some info on the Allstar can be gleaned from
>   http://www.navtechgps.com/supply/cmcallst.asp
>CMC has a large number of versions of their firmware. Some supported 2, 5
>or 10 Hz phase measurements, some only 1 Hz rate, while some had no phase
>measurements. Some had code to be a DGPS base station, most didn't. Some
>various breeds of the receiver cost anywhere from $175 to $2000 from
>NavtechGPS, with the only difference being the firmware loaded into them. So
>be careful to know what you're getting!
>
>BTW, I believe that Rick's TAC32 supports at least some of the Allstar
>receivers.
>
>73, de Tom, W3IWI

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] Re: Marconi AllStar 12

From: Doug Bade <doug@clecom.com>
Date: Wed, 14 Nov 2001 12:33:03 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46711-2001.11.14-12.00.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

After consulting the manual and connecting it up, I am not getting
a post message, as manual suggests. The pinout looks the same as in the
manual, but is unknown firmware at this time.. Tac32 does not seem to make
serial connection. I am not absolutely positive on pinouts, but if anyone
has personal experience info on the Marconi Allstar, it would be helpful.
Thanks, Doug

The seller is at :

"Greg Donohoe" <greg_donohoe@hotmail.com>

Email him for pricing.

At 10:58 PM 11/13/01 -0600, you wrote:
>At 15:33 11/13/2001, Doug Bade, wrote:
> >   I am in need of connection info and preferably a user manual for
> a Marconi
> >AllStar 12 GPS receiver. The links sent to me for Marconi.ca documentation

> >appear to be unavailable. If any one has a PDF or can tell me where to get
> >a manual I would appreciate it.. Thanks,
>
>http://MakeAshorterLink.com/?Z5A22592
>
>http://www.cmcelectronics.ca/products-services/custom-elect/930-600018-000.pdf
>
>http://www.Google.com/search?q=Marconi+AllStar+12+GPS+receiver+user+manual
> >
> >If anyone is interested in more of these, there is a seller with about 350+
> >available, pretty cheap. Doug
>
>Who, where & how much?
>
>Start Here to Find It Fast!© -> http://www.US-Webmasters.com/start.htm
>
>
>---
>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] TAC32 type software for Trimble TSIP

From: Doug Bade <doug@clecom.com>
Date: Thu, 15 Nov 2001 18:05:53 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46894-2001.11.15-17.33.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does anyone have a suggestion of a piece of monitor software for TSIP
protocol from a Trimble DSM board?

Limited nmea on port 1 but a whole lot of stuff on port 2. Trimble DSM
software shows text, but I am looking for a graphical plotting software
with comms to the GPS for test/evaluation.

Thanks, Doug Bade

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Most unusual suitcase clock

From: "Gregory Beat" <gregory.beat@home.com>
Date: Thu, 15 Nov 2001 21:50:40 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46922-2001.11.15-22.17.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Saw this item on eBay this evening

http://cgi.ebay.com/aw-cgi/eBayISAPI.dll?ViewItem&item=1664515163

True Time 468-FPC Satellite Clock NICE!!
Item # 1664515163

Guess it use the GOES satellite for a lock. Portable !

Greg
w9gb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] Re: Most unusual suitcase clock

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Thu, 15 Nov 2001 20:26:08 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-46923-2001.11.15-22.58.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The photo of this clock says "NBS TIME" That shows us the age of this item as they have been NIST for quite some time.

73,
Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

18. [tacgps] Re: Marconi AllStar 12

From: Doug Bade <doug@clecom.com>
Date: Mon, 19 Nov 2001 12:02:37 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-47632-2001.11.19-11.29.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Well, to anyone following this story, I finally got my CMC AllStar 12 running today, and have the Trimble 12ch DSM running too... Both are indicating very tight positioning for an antenna on the ground behind my office. I am using the home brew choke ring antenna. I am watching a definite fall off of signal strength based on elevation incoming from sat's. It is what I expect to see, but may not be optimal, from a choke ring style antenna.Lower signals from lower to the horizon.. A very nice visual taper with Tac32...

These GPS boards are rover end boards, and not station end.

I have a question reference the Carrier Phase GPS units.. Does the GPS engine use this info internally to solve it's position ? as these boards show better position stability than my Oncore's or any other OEM board I have played with in this environment... Or is the Carrier Phase info just a packet set to be sent out on serial port for a logging application to be used for post processing at a later time???

These boards are each $50.00 plus shipping from the seller listed below.. I just had a connection problem with a third power feed to the CMC board..

Tac32 and SAWatch now work fine with both units, Tac32 in what seems like binary mode is now working just great.. Doug Bade

At 12:33 PM 11/14/01 -0500, you wrote:
> After consulting the manual and connecting it up, I am not
> getting a post message, as manual suggests. The pinout looks the same as
> in the manual, but is unknown firmware at this time.. Tac32 does not seem
> to make serial connection. I am not absolutely positive on pinouts, but
> if anyone has personal experience info on the Marconi Allstar, it would
> be helpful. Thanks, Doug
>
>
>The seller is at :
>
>"Greg Donohoe" <greg_donohoe@hotmail.com>
>
>
>Email him for pricing.
>

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19. [tacgps] Re: tacgps digest: January 19, 2001

From: "Larry Kayser" <_kayser@sympatico.ca>
Date: Thu, 29 Nov 2001 20:13:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49282-2001.11.29-19.40.55--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/html

[Empty message body]

20. [tacgps] VIRUS warning !

From: "Gregory Beat" <gregory.beat@home.com>
Date: Thu, 29 Nov 2001 20:59:39 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49300-2001.11.29-21.27.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Do not open attachment form Larry Kayser. attachment has the
new W32.Badtrans virus.

Greg
w9gb

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] Re: VIRUS warning !

From: NE2E@aol.com
Date: Thu, 29 Nov 2001 22:04:26 EST
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49302-2001.11.29-21.32.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

In a message dated 11/29/2001 10:00:58 PM Eastern Standard Time,
gregory.beat@home.com writes:

>
> Do not open attachment form Larry Kayser. attachment has the
> new W32.Badtrans virus.
>
> Greg
> w9gb
>

That is correct DO NOT OPEN IT unless your virus software is up to date..

Fred

22. [tacgps] VIRUS alert: BadTrans

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 30 Nov 2001 06:18:44 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49357-2001.11.30-06.47.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Larry Kayser has been BadTrans'd
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] Badtrans.B details

From: "Gregory Beat" <gregory.beat@home.com>
Date: Fri, 30 Nov 2001 06:53:45 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49363-2001.11.30-07.21.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A revised version of the Badtrans worm from April 2001 is loose on the
Internet. Badtrans.B behaves in a similar manner to the original, loading a
password-stealing Trojan horse that can log keystrokes and reveal password
and credit card information to malicious users. However, this version uses a
vulnerability in Internet Explorer that automatically opens the e-mail
attachments when previewed. Reports from all over the world state that this
worm is spreading. Because the worm sends e-mail and automatically executes
on some computers, Badtrans.B ranks a 6 on the ZDNet Virus Meter.
How it works
Badtrans.B arrives as e-mail. It replies to old e-mail, so the subject line
is one that someone has already sent you, so you might be inclined to open
it. The e-mail message itself is empty. Badtrans.B includes an attached file
whose name is created from the following list:

FUN
HUMOR
DOCS
S3MSONG
Sorry_about_yesterday
ME_NUDE
CARD
SETUP
SEARCHURL
YOU_ARE_FAT!
HAMSTER NEWS_DOC
New_Napster_Site
README
IMAGES
PICS

The attachment is a DOC, MP3, or ZIP file, with a second extension of either SCR or PIF. For example, an attached file might be named Readme.doc.scr.

Users need not open the attached file to infect their machines. Badtrans uses a known vulnerability in Internet Explorer that automatically opens attachments. In this case, the attached file contains Troj.PWS-AV, a password-stealing Trojan horse. Troj.PWS-AV records all keystrokes and the application name where a keystroke was typed, storing it in encrypted form. The Trojan then connects to a SMTP server to send the log file to a Hotmail e-mail address.

Prevention
Badtrans.B uses a known vulnerability in Outlook Express that is included in Internet Explorer 5.01 and 5.5. Microsoft has released a patch. Users who have not loaded the patch are encouraged to do so or to upgrade to Internet Explorer 6.

Removal
Most antivirus software companies have updated their signature files to include this worm. For more information on removing this worm from your system, see Central Command, F-Secure, Kaspersky,McAfee, Sophos, Symantec, or Trend Micro.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: VIRUS alert: BadTrans

From: "Larry Kayser" <kayser@sympatico.ca>
Date: Fri, 30 Nov 2001 19:14:53 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-49429-2001.11.30-18.47.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gerry

> Larry Kayser has been BadTrans'd

Boy was I ever! Sorry for the problem but I have it fixed now.

$300 in cash, a whole day and 175 miles of driving.
Thank You Gerry for letting me know

Larry
VA3LK

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December 2001

Original source file: tacgps.0112
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0112

1. [tacgps] GPS osc displining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Mon, 10 Dec 2001 12:55:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51346-2001.12.10-14.29.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Do you have any references that address the following issue, regarding disciplining an oscillator with gps?

The gps 1 pps signal has jitter, e.g. something of the order of 100ns, and also the osc being disciplined has a drift, e.g. a poor oven might allow the temp to change a few degrees as the ambient changes, giving rise to a change in freq, as well as its derivatives. I *think* that these two "noises" determine the limit on the accuracy of the disiplined osc, assuming the controller is optimal. If the controller followed the 1 pps too closely, then the disciplined osc would have poor short term stability, but the drift due to temp would be servo'ed out. However, if the controller loop filtering has an extremely low bandwidth, then the 1 pps jitter is filtered out, but the temp dift will not be disciplined. It seems like there is a "middle ground" and that results in "the best one can do," with the given specifications.

I have not had much success finding anything addressing this, yet it seems like something that would have been thoroughly studied (or, it is simple enough that it is "left as an exercise for the student," as many engineering texts are wont to say (and I'm sure the prof chuckled when he or she put that in--seemed to me those problems always were more difficult than they first appeared).

Anyway, discipling my Rb, as well as some similar projects, have been on my "list" for years, and this one happens to be hot at the moment.

Don, W4DH

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: GPS osc displining references

From: John Ackermann N8UR <jra@febo.com>
Date: Mon, 10 Dec 2001 15:14:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51348-2001.12.10-14.42.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Don --

There's been a *lot* of discussion over the years in the TAPR "tacgps" mailing list. There are searchable archives available from the www.tapr.org web page, and looking there should turn up lots of info. There was also an article in QST about two years ago by Brooks Shera on a PIC-based controller to discipline an oscillator to GPS.

As you noted, there is a lot of noise on the GPS 1pps, but when you average over a long time period that noise goes away. Brooks' controller has a control loop time constant that's selectable out to several hours (maybe even days, I forget) and the best time constant to use depends on the long-term stability of the disciplined oscillator -- with a very good crystal or Rb, you can use a time constants of many hours, if not days. A lower quality oscillator requires a shorter loop time constant. The longer the time constant you can use, the less the short-term GPS noise will affect the short-term performance of the oscillator. When you get the right balance, you get the best of both worlds -- crystal or Rb short term stability, and GPS long term stability.

The QST article has some good stuff on this, but the tacgps list will provide lots of more detailed information and pointers to other sources.

Hope this helps.

73,
John N8UR
jra@febo.com

--On Monday, December 10, 2001 12:55 PM -0500 Donald E Haselwood
<dhaselwood@ij.net> wrote:

> Do you have any references that address the following issue, regarding
> disciplining an oscillator with gps?
>
> The gps 1 pps signal has jitter, e.g. something of the order of 100ns, and
> also the osc being disciplined has a drift, e.g. a poor oven might allow
> the temp to change a few degrees as the ambient changes, giving rise to a
> change in freq, as well as its derivatives. I *think* that these two
> "noises" determine the limit on the accuracy of the disiplined osc,
> assuming the controller is optimal. If the controller followed the 1 pps
> too closely, then the disciplined osc would have poor short term
> stability, but the drift due to temp would be servo'ed out. However, if
> the controller loop filtering has an extremely low bandwidth, then the 1
> pps jitter is filtered out, but the temp dift will not be disciplined. It
> seems like there is a "middle ground" and that results in "the best one
> can do," with the given specifications.
>
> I have not had much success finding anything addressing this, yet it seems
> like something that would have been thoroughly studied (or, it is simple
> enough that it is "left as an exercise for the student," as many
> engineering texts are wont to say (and I'm sure the prof chuckled when he
> or she put that in--seemed to me those problems always were more difficult
> than they first appeared).
>
> Anyway, discipling my Rb, as well as some similar projects, have been on
> my "list" for years, and this one happens to be hot at the moment.
>
> Don, W4DH
>
>
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] RE: GPS osc displining references

From: jim_johnson@agilent.com
Date: Mon, 10 Dec 2001 12:18:27 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51350-2001.12.10-14.46.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Don,

    I am pleased to report that this problem has been solved ...
by Brooks Shera. He wrote an article in QST a couple of
years ago (somebody will report the exact reference on the
reflector) describing a controller he build (boards and parts are
available) that slaves an oscillator to the 1PPS output of a GPS
receiver. A colleague of mine and I both built one of these and
they work very nicely. In our case, we slaved high quality, double
oven quartz oscillators to the 1PPS. Stay tuned to the reflector
and I'm sure others will report on this as well.

73,
Jim W6SC

> -----Original Message-----
> From: Donald E Haselwood [mailto:dhaselwood@ij.net]
> Sent: Monday, December 10, 2001 9:55 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] GPS osc displining references
>
>
> Do you have any references that address the following issue, regarding
> disciplining an oscillator with gps?
>
> The gps 1 pps signal has jitter, e.g. something of the order
> of 100ns, and
> also the osc being disciplined has a drift, e.g. a poor oven
> might allow
> the temp to change a few degrees as the ambient changes,
> giving rise to a
> change in freq, as well as its derivatives. I *think* that these two
> "noises" determine the limit on the accuracy of the disiplined osc,
> assuming the controller is optimal. If the controller
> followed the 1 pps
> too closely, then the disciplined osc would have poor short
> term stability,
> but the drift due to temp would be servo'ed out. However, if the
> controller loop filtering has an extremely low bandwidth,
> then the 1 pps
> jitter is filtered out, but the temp dift will not be disciplined. It
> seems like there is a "middle ground" and that results in
> "the best one can
> do," with the given specifications.
>
> I have not had much success finding anything addressing this,
> yet it seems
> like something that would have been thoroughly studied (or,
> it is simple
> enough that it is "left as an exercise for the student," as many
> engineering texts are wont to say (and I'm sure the prof
> chuckled when he
> or she put that in--seemed to me those problems always were
> more difficult
> than they first appeared).
>
> Anyway, discipling my Rb, as well as some similar projects,
> have been on my
> "list" for years, and this one happens to be hot at the moment.
>
> Don, W4DH
>
>
>
> ---
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4. [tacgps] Re: GPS osc displining references

From: John Ackermann N8UR <jra@febo.com>
Date: Mon, 10 Dec 2001 15:20:13 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51351-2001.12.10-14.48.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi again, Don (and tacgps folks) --

I responded to your posting when it showed up on the netsig@lists.tapr.org
mailing list; obviously, you also subscribe to tacgps, so part of my reply
seems a bit odd when viewed here! But I still suggest checking the
searchable archive for detailed info.

73,
John

--On Monday, December 10, 2001 3:14 PM -0500 John Ackermann N8UR
<jra@FEBO.COM> wrote:

> Hi Don --

>
> There's been a *lot* of discussion over the years in the TAPR "tacgps"
> mailing list. There are searchable archives available from the
> www.tapr.org web page, and looking there should turn up lots of info.
> There was also an article in QST about two years ago by Brooks Shera on a
> PIC-based controller to discipline an oscillator to GPS.
>
> As you noted, there is a lot of noise on the GPS 1pps, but when you
> average over a long time period that noise goes away. Brooks' controller
> has a control loop time constant that's selectable out to several hours
> (maybe even days, I forget) and the best time constant to use depends on
> the long-term stability of the disciplined oscillator -- with a very good
> crystal or Rb, you can use a time constants of many hours, if not days.
> A lower quality oscillator requires a shorter loop time constant. The
> longer the time constant you can use, the less the short-term GPS noise
> will affect the short-term performance of the oscillator. When you get
> the right balance, you get the best of both worlds -- crystal or Rb short
> term stability, and GPS long term stability.
>
> The QST article has some good stuff on this, but the tacgps list will
> provide lots of more detailed information and pointers to other sources.
>
> Hope this helps.
>
> 73,
> John N8UR
> jra@febo.com
>
> --On Monday, December 10, 2001 12:55 PM -0500 Donald E Haselwood
> <dhaselwood@ij.net> wrote:
>
>> Do you have any references that address the following issue, regarding
>> disciplining an oscillator with gps?
>>
>> The gps 1 pps signal has jitter, e.g. something of the order of 100ns,
>> and also the osc being disciplined has a drift, e.g. a poor oven might
>> allow the temp to change a few degrees as the ambient changes, giving
>> rise to a change in freq, as well as its derivatives. I *think* that
>> these two "noises" determine the limit on the accuracy of the disiplined
>> osc, assuming the controller is optimal. If the controller followed the
>> 1 pps too closely, then the disciplined osc would have poor short term
>> stability, but the drift due to temp would be servo'ed out. However, if
>> the controller loop filtering has an extremely low bandwidth, then the 1
>> pps jitter is filtered out, but the temp dift will not be disciplined.
>> It seems like there is a "middle ground" and that results in "the best
>> one can do," with the given specifications.
>>
>> I have not had much success finding anything addressing this, yet it
>> seems like something that would have been thoroughly studied (or, it is
>> simple enough that it is "left as an exercise for the student," as many
>> engineering texts are wont to say (and I'm sure the prof chuckled when he
>> or she put that in--seemed to me those problems always were more
>> difficult than they first appeared).
>>
>> Anyway, discipling my Rb, as well as some similar projects, have been on
>> my "list" for years, and this one happens to be hot at the moment.
>>
>> Don, W4DH
>>
>>
>>
>> ---
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>>
>>
>
>
>
> ----
> John Ackermann   N8UR   jra@febo.com   http://www.febo.com
> President, TAPR   n8ur@tapr.org   http://www.tapr.org
>
>
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>
>

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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5. [tacgps] Re: GPS osc displining references

From: GS <gsanders1@bigfoot.com>
Date: Mon, 10 Dec 2001 16:05:12 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51358-2001.12.10-15.33.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John Ackermann N8UR wrote:
>
> Hi Don --
>
> There's been a *lot* of discussion over the years in the TAPR "tacgps"
> mailing list. There are searchable archives available from the
> www.tapr.org web page, and looking there should turn up lots of info.
> There was also an article in QST about two years ago by Brooks Shera on a
> PIC-based controller to discipline an oscillator to GPS.

Here's a link to Brooks' web page describing his controller. I've
built it and it works well.

http://www.rt66.com/~shera/

Gary Sanders

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6. [tacgps] Re: GPS osc displining references

From: Alberto di Bene <dibene@usa.net>
Date: Tue, 11 Dec 2001 11:07:34 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51468-2001.12.11-04.36.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

GS wrote:

>
> Here's a link to Brooks' web page describing his controller. I've
> built it and it works well.
>
> http://www.rt66.com/~shera/
>
> Gary Sanders
>

Does anybody knows if/where the source code of the PIC 16C73A
controller in the Shera's project is available ? Thanks.

73 Alberto I2PHD

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7. [tacgps] Re: GPS osc displining references

From: "W5SNX" <w5snx@atl.mediaone.net>
Date: Tue, 11 Dec 2001 11:42:41 -0000
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51471-2001.12.11-06.11.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The source code is available from Brooks Shera at his site.

----- Original Message -----
From: "Alberto di Bene" <dibene@usa.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, December 11, 2001 10:07
Subject: [tacgps] Re: GPS osc displining references

> GS wrote:
>
> >
> > Here's a link to Brooks' web page describing his controller. I've
> > built it and it works well.
> >
> > http://www.rt66.com/~shera/
> >
> > Gary Sanders
> >
>
> Does anybody knows if/where the source code of the PIC 16C73A
> controller in the Shera's project is available ? Thanks.
>
> 73 Alberto I2PHD
>
>
>
> ---
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8. [tacgps] Re: GPS osc displining references

From: Alberto di Bene <dibene@usa.net>
Date: Tue, 11 Dec 2001 13:22:30 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51480-2001.12.11-06.51.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

W5SNX wrote:

> The source code is available from Brooks Shera at his site.
>

Thanks, but I have found there only the binary (hex) code for the
PIC. There are a couple other source codes, but they are for
accessory applications to format the output of the GPS, not for
the PIC controller used in the project.

73 Alberto I2PHD

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9. [tacgps] Position average versus time?

From: John Ackermann N8UR <jra@febo.com>
Date: Tue, 11 Dec 2001 09:13:21 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51490-2001.12.11-08.41.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I'm about to start a TAC-32 position survey and am curious whether there's
any general sense of position accuracy versus averaging time now that SA is
gone. In other words, what's the point of diminishing returns, and what
kind of accuracy ("I know where I am within X meters") can be expected for
a given survey time.

Alternatively, an explanation about how to reduce the averaging data that
TAC-32 makes available down to a simple accuracy figure would do -- I'm
mathematically challenged.

John

John Ackermann N8UR jra@febo.com http://www.febo.com
President, TAPR n8ur@tapr.org http://www.tapr.org

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10. [tacgps] Re: GPS osc displining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Tue, 11 Dec 2001 13:05:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51515-2001.12.11-12.37.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John,

Thanks. I'll revisit the TAPR archives a look. I don't remember any discussions about the best approach to the controller. There were some discussions about of how to connect into the Rb for steering it.

I've looked at Brooks Shera's controller. He a did an excellent job that is quite satisfactory for most purposes. I think for steering the Rb it can be improved--at least that is what I'm looking into.

He implements a PI loop which results in a second-order loop. If the osc being disciplined is off freq, but constant, then the loop will pull it onto freq. If the freq is changing--"a cool breeze blows through the window," and the osc being disciplined begins changing freq--the loop "can't keep up," resulting frequency error. A third order loop will remove a linearly changing freq.

The osc steering is very similar to the problem of tracking a xmitter carrier in a satellite (Gardener's book, _PhaseLock Techniques_ 1966 is the classic ref). The noise analyses, however, are a little different than the situation here.

Another aspect of Brooks' approach is that the measurement of phase between the xtal/Rb and the 1 pps is based on a xtal osc. A drift in that osc then appears as changes in the "setpoint" of the phase locked loop. This is a secondary error (looks like 1E-10 to 1E-11 (but I need to review this)). It wouldn't have much practical affect when disciplining a quartz osc, but it is significant for the Rb. This can overcome by either phase locking that xtal, measuring the time between 1 pps pulses, or driving the micro directly from the Rb. I have a breadboard with the last scheme that I was experimenting with back when the Rb issue was hot on this list. A move, amongst other things, put it all in the background.

Don, W4DH

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11. [tacgps] Re: GPS osc displining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Tue, 11 Dec 2001 13:04:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51516-2001.12.11-12.37.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Alberto,

Yes it is available, but with some restriction. Email Brooks. I've looked at the code and it is commented sufficiently that one doesn't have to fully understand PIC assembly language to trace what is being done.

Don, W4DH

At 11:07 AM 12/11/01 +0100, you wrote:

>GS wrote:
>
>>
>> Here's a link to Brooks' web page describing his controller. I've
>> built it and it works well.
>>
>> http://www.rt66.com/~shera/
>>
>> Gary Sanders
>>
>
>Does anybody knows if/where the source code of the PIC 16C73A
>controller in the Shera's project is available ? Thanks.
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>73 Alberto I2PHD
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>

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12. [tacgps] Re: GPS osc displining references

From: "Brooks Shera" <ebs@lanl.gov>
Date: Tue, 11 Dec 2001 12:44:00 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51530-2001.12.11-14.12.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

A couple of comments on Don's discussion of my GPS-VCXO controller design:

>
> He implements a PI loop which results in a second-order loop. If the osc
> being disciplined is off freq, but constant, then the loop will pull it
> onto freq. If the freq is changing--"a cool breeze blows through the
> window," and the osc being disciplined begins changing freq--the loop
> "can't keep up," resulting frequency error. A third order loop will
remove
> a linearly changing freq.
>
> The osc steering is very similar to the problem of tracking a xmitter
> carrier in a satellite (Gardener's book, _PhaseLock Techniques_ 1966 is
the
> classic ref). The noise analyses, however, are a little different than
the
> situation here.

The controller does use a 2nd order loop, primarily because such a loop in
unconditionally stable. Higher order loops can readily oscillate if the
loop gain is not set carefully (see Gardner p.18). A precise loop gain is
hard to guarantee since the controller was designed to be used with a
variety of VCXOs. If it were necessary it could have been done with
considerable effort on the part of the builder. But really, there is little
to be gained by going to a 3rd order loop. Don's comment that a ramping
VCXO frequency will cause a FREQUENCY error in a 2nd order loop is
misleading. It actually causes a PHASE offset (see Gardner, Table 4.1) .
This phase offset is of little importance for a frequency standard that is
operating with a reasonably stable VCXO.

>
> Another aspect of Brooks' approach is that the measurement of phase
between
> the xtal/Rb and the 1 pps is based on a xtal osc. A drift in that osc
then
> appears as changes in the "setpoint" of the phase locked loop. This is a
> secondary error (looks like 1E-10 to 1E-11 (but I need to review this)).
> It wouldn't have much practical affect when disciplining a quartz osc, but
> it is significant for the Rb. This can overcome by either phase locking
> that xtal, measuring the time between 1 pps pulses, or driving the micro
> directly from the Rb.

As explained in the article, drift of the inexpensive 24 MHz xtal osc is
essential to overcoming the +/- 1 count ambiguity in the phase measuring
circuit. If the 24 MHz osc were looked to the VCXO the count ambiguity
would cause a phase error of +/- 42 nsec. Drift of the 24 MHz xtal reduces
the error to a small fraction of this amount. Also, the effect of the drift
of even a cheap xtal on the phase setpoint is negligible.

Brooks

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13. [tacgps] RE: Position average versus time?

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Tue, 11 Dec 2001 23:22:35 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51617-2001.12.11-23.51.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John I ran a C/A code test about two weeks ago, for 2 days. After
averaging, the position was within 3 meters. I do not have the data with me
- I am at work - I'll try to remember to look at it in the morning and put
some of the highlights up here.

I used excel and just extracted the gga string.
> ----------
> From: John Ackermann N8UR[SMTP:jra@febo.com]
> Reply To: TAPR Special Interest Group
> Sent: Tuesday, December 11, 2001 8:13 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Position average versus time?
>
> I'm about to start a TAC-32 position survey and am curious whether there's
>
> any general sense of position accuracy versus averaging time now that SA
> is
> gone. In other words, what's the point of diminishing returns, and what
> kind of accuracy ("I know where I am within X meters") can be expected for
>
> a given survey time.
>
> Alternatively, an explanation about how to reduce the averaging data that
> TAC-32 makes available down to a simple accuracy figure would do -- I'm
> mathematically challenged.
>
> John
>
> ----
> John Ackermann   N8UR   jra@febo.com   http://www.febo.com
> President, TAPR   n8ur@tapr.org   http://www.tapr.org
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>

14. [tacgps] Re: GPS osc displining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Wed, 12 Dec 2001 13:36:21 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51690-2001.12.12-13.04.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

Good comments that stimulated my thinking!

>The controller does use a 2nd order loop, primarily because such a loop in
>unconditionally stable.

And a very good choice for a general purpose controller.

BTW, after doing some simulations for another home project, (steering the
time keeping on my "gizmo's" on my RS-485 network), I discovered that with
a digital implementation, a second order loop is NOT unconditionally stable
for all gains. It took me a while to understand what was happening, as I

was also of the thinking that the second order loop was unconditionally stable. (In fact, that's why I emailed you about the source code--I couldn't figure out what I was doing wrong.) What happens is that at high gains the loop frequency (which increases with gain) can reach the point where the approximations for the digital filter fall apart, or put another way, the loop frequency was getting too close to the sampling frequency--a situation that would not be a problem in the gps osc steering situation, but something my simulations for the "time keeping" ran into (where getting on-time quickly was a big consideration).

>Higher order loops can readily oscillate if the
>loop gain is not set carefully (see Gardner p.18).

The unstable region is for low gains. Above that, the loop remains stable for all gains, so it doesn't look so critical for the phase-locked loop situation.

>But really, there is little
>to be gained by going to a 3rd order loop.

It looks like there are advantages to the 3rd order loop. The 3rd order loop has "memory" for rate of change of freq, whereas the 2nd order loop holds just frequency (p51,52 (BTW it looks like your p18 corresponds to p16 in my old, yellowed book)). Blanchard, _Phase-Locked Loops: Application to Coherent Receiver Design_, 1976 (pages aren't quite so yellow!), shows that the 3rd order loop is optimum in the presence of noise, when the disturbance is a frequency ramp (the cool breeze through the window syndrome).

>Don's comment that a ramping
>VCXO frequency will cause a FREQUENCY error in a 2nd order loop is
>misleading. It actually causes a PHASE offset (see Gardner, Table 4.1) .
>This phase offset is of little importance for a frequency standard that is
>operating with a reasonably stable VCXO.

Quite true for the *steady state*. However, for discipling the osc, the problem is dealing with change, e.g. the daily temp fluctuations are the major cause of Rb drift (I found an article that showed a graph and made this statement). One could approximate this error input as a sine wave with a 24 hour period. The task is to come up with a loop design that minimizes the error. It seems like the "noises" are the key factor in the loop design, and that's where I bog down (it's been 40 yrs since my last grad level course on this, so I'm a bit rusty).

The whole issue revolves around the "reasonably stable VCXO"--it is that instability that we are trying to reduce. Gardner's chapt on optimization talks about Wiener optimization; Blanchard uses it too. I suspect that Wiener or Kalman filtering might be the area of references I need to pursue.

>As explained in the article, drift of the inexpensive 24 MHz xtal osc is
>*essential* to overcoming the +/- 1 count ambiguity in the phase measuring
>circuit. If the 24 MHz osc were looked to the VCXO the count ambiguity
>would cause a phase error of +/- 42 nsec. Drift of the 24 MHz xtal reduces
>the error to a small fraction of this amount. Also, the effect of the drift
>of even a cheap xtal on the phase setpoint is negligible.

After revisiting the setpoint changing issue it is now looking like it is not a major factor. If the setpoint were at 1000 counts (of the 24 Mhz counter) and there is a change of 10 ppm of the 24 Mhz osc, then there is a shift of the setpoint of .01 counts, out of a total one second count of 24E6, which translates to 4.2E-10 counts per one second interval. If it takes 1000 seconds for the 24 Mhz osc change, then the rate of shift is about 4.2E-13 cycles per second. Since the Rb appears--at best--stable in the 1E-12 to 1E-13 realm, then 4.2E-13--at worst--is not going to ruin the results. I was off by two orders magnitude on my earlier estimate.

Concerning the drift and the increased resolution, I don't think the drift is necessary. Certainly it increases the resolution of the measurement, after averaging. If the osc were perfect, or more practical, phase locked to the Rb, then the loop would track to the point where the transition of the 24 Mhz osc counter fell exactly at the 1 pps event. Without the jitter on the 1 pps signal there would be a limit cycle that would be determined by the loop. With jitter, the limit cycle issue gets more complicated, and I expect it becomes a secondary factor.

What led me to this thinking was wrestling with the resolution of the HC11 input-capture. I had an HC11 setup going about the same time you were working on your controller, where the micro clock input was driven by the Rb. At 10 Mhz, the input capture resolution is 400ns, which is rather course. The move and other life events put the project into the "think

about" category. I had been pondering ways to improve this (and do so
simply, e.g. faster micros, FPGAs, dither schemes,...), when it struck me
that it is not all that important--the loop will stabilize with the 1 pps
event coming exactly at the micro's bus cycle transition, so that the gps
jitter will cause half of the events before and half after the micro's bus
transition. The hardware is then "dog simple"--the Rb goes to the EXTAL
input, and the gps goes to a input-capture pin. (The setpoint issue also
goes away.)

Another improvement might come from utilizing the 100 pps option with the
Mot UT+. The specs say that the 1 pps can be switched to 100 pps, though
I haven't tried this. The faster rate would help the averaging. The price
paid is that the feature is not as common as the 1 pps on other gps engines.

Anyway, that's where I'm at with it. If you run across some good
references I'd appreciate if you would send them to me.

Don, W4DH

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: GPS osc displining references

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Wed, 12 Dec 2001 11:53:34 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51697-2001.12.12-14.22.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Here's a back-of-the-envelope calculation and a question
for Brooks and Don.

A typical Rb has a frequency drift rate of around 3E-11
per month which is about 1E-13/day (or 10 ns/day/day).

A typical GPS receiver has about 100 ns short-term
1 PPS noise which, along with all the other systematic
GPS time transfer errors, might average down to, what,
about 10 ns to 30 ns per day?

To me that would argue that a discipline action on
the order of once or twice a day is all that a Rb
needs. I'm curious if there is performance data on
how Brooks' board does with a Rb vs. a OCXO.

It would also suggest to me that higher-order loops
have little to offer - the Rb drift rate being small
compared to the relative lack of short-term and
mid-term precision of the GPS tick; i.e., the daily
drift is not much different than the daily noise.

I ask because there's been a lot written about
using OCXO's with Brooks' board but not much
about using Rb's. Given that the average Rb has
about 1000x less drift than the average OCXO I
wonder if the existing implementation works as
well for each.

/tvb

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16. [tacgps] Re: GPS osc displining references

From: John Ackermann N8UR <jra@febo.com>
Date: Wed, 12 Dec 2001 15:07:14 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51703-2001.12.12-14.35.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Just as a data point, I was looking this morning at the web info on the SRS
rubidium oscillator, and discovered that it has the built-in ability to be
steered by a 1pps signal. There is a chart showing stability with and

without steering. Check http://www.srsys.com/html/prs10.html for info on
their system.

John

--On Wednesday, December 12, 2001 11:53 AM -0800 Tom Van Baak
<tvb@leapsecond.com> wrote:

> Here's a back-of-the-envelope calculation and a question
> for Brooks and Don.
>
> A typical Rb has a frequency drift rate of around 3E-11
> per month which is about 1E-13/day (or 10 ns/day/day).
>
> A typical GPS receiver has about 100 ns short-term
> 1 PPS noise which, along with all the other systematic
> GPS time transfer errors, might average down to, what,
> about 10 ns to 30 ns per day?
>
> To me that would argue that a discipline action on
> the order of once or twice a day is all that a Rb
> needs. I'm curious if there is performance data on
> how Brooks' board does with a Rb vs. a OCXO.
>
> It would also suggest to me that higher-order loops
> have little to offer - the Rb drift rate being small
> compared to the relative lack of short-term and
> mid-term precision of the GPS tick; i.e., the daily
> drift is not much different than the daily noise.
>
> I ask because there's been a lot written about
> using OCXO's with Brooks' board but not much
> about using Rb's. Given that the average Rb has
> about 1000x less drift than the average OCXO I
> wonder if the existing implementation works as
> well for each.
>
> /tvb
>
>
>
> ---
> You are currently subscribed to tacgps as: JRA@FEBO.COM
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>
>
>

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

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17. [tacgps] Re: GPS osc displining references

From: jim_johnson@agilent.com
Date: Wed, 12 Dec 2001 12:43:25 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51706-2001.12.12-15.11.48--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hmmm, my "envelope" shows a drift rate of 3E-11/month yielding
about 86 ns/day/day, which makes the drift rate about 3 times
that of the daily noise, assuming the noise is averaged down to
about 30 ns/day. Am I off somewhere?

Tnx,
Jim W6SC

> -----Original Message-----
> From: Tom Van Baak [mailto:tvb@leapsecond.com]
> Sent: Wednesday, December 12, 2001 11:54 AM
> To: TAPR Special Interest Group

> Subject: [tacgps] Re: GPS osc displining references
>
>
> Here's a back-of-the-envelope calculation and a question
> for Brooks and Don.
>
> A typical Rb has a frequency drift rate of around 3E-11
> per month which is about 1E-13/day (or 10 ns/day/day).
>
> A typical GPS receiver has about 100 ns short-term
> 1 PPS noise which, along with all the other systematic
> GPS time transfer errors, might average down to, what,
> about 10 ns to 30 ns per day?
>
> To me that would argue that a discipline action on
> the order of once or twice a day is all that a Rb
> needs. I'm curious if there is performance data on
> how Brooks' board does with a Rb vs. a OCXO.
>
> It would also suggest to me that higher-order loops
> have little to offer - the Rb drift rate being small
> compared to the relative lack of short-term and
> mid-term precision of the GPS tick; i.e., the daily
> drift is not much different than the daily noise.
>
> I ask because there's been a lot written about
> using OCXO's with Brooks' board but not much
> about using Rb's. Given that the average Rb has
> about 1000x less drift than the average OCXO I
> wonder if the existing implementation works as
> well for each.
>
> /tvb
>
>

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18. [tacgps] Re: GPS osc displining references

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Wed, 12 Dec 2001 12:48:30 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51708-2001.12.12-15.24.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Just as a data point, I was looking this morning at the web info on the
SRS
> rubidium oscillator, and discovered that it has the built-in ability to be
> steered by a 1pps signal. There is a chart showing stability with and
> without steering. Check http://www.srsys.com/html/prs10.html for info on
> their system.
>
> John

Yes, the PRS10 is a very nice example. Note
the cross-over point occurs somewhere around
2-300,000 seconds; about 3 days.

/tvb

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19. [tacgps] Re: GPS osc displining references

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Wed, 12 Dec 2001 13:04:52 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51710-2001.12.12-15.33.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Hmmm, my "envelope" shows a drift rate of 3E-11/month yielding
> about 86 ns/day/day, which makes the drift rate about 3 times
> that of the daily noise, assuming the noise is averaged down to
> about 30 ns/day. Am I off somewhere?
>

> Tnx,
> Jim W6SC

Yeah, that's more like it. My typo. 3E-11/month is
1E-12/day. Still, my guess is most Rb do quite a
bit better than that spec and are down in parts in
10^13th per day. What happens to the algorithm
when the daily drift rate is on the order of the daily
noise?

Interesting also to note the PRS10 plot shows GPS
never getting below 1E-12 even after 2 weeks.

/tvb

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20. [tacgps] partial schematic needed for HP Z3801

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Wed, 12 Dec 2001 13:24:13 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51716-2001.12.12-15.58.00--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Does any one out there have at least the portion of the schematic for the HP GPS
receiver model Z3801 that is the temperature regulator and control for the outer
oven on the double oven crystal oscillator? This oscillator has only the heater
and thermistor in the outer oven and all temperature control was done elsewhere
in the receiver. I have one of these oscillators and would like to use it with
Shera's board. Although I could design a controller from scratch, I am certain
that a lot of time was spent characterising the thermal loop characteristics at
HP and an optimal feedback loop was designed. Thus it would be useful to simply
build one breadboard from their design.

If anyone has this schematic, could you either scan it at high resolution or
make a very clear photocopy and mail it to me if I pay for your costs? I would
also need the associated parts list.

73,

Jeffrey Pawlan, WA6KBL

jpawlan@pawlan.com

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21. [tacgps] Re: GPS osc displining references

From: Alberto di Bene <dibene@usa.net>
Date: Thu, 13 Dec 2001 13:42:58 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51837-2001.12.13-07.12.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John Ackermann N8UR wrote:

> Just as a data point, I was looking this morning at the web info on the SRS
> rubidium oscillator, and discovered that it has the built-in ability to be
> steered by a 1pps signal. There is a chart showing stability with and
> without steering. Check http://www.srsys.com/html/prs10.html for info on
> their system.
>

It looks like also the PRS10 uses a second-order loop to lock into the
external 1-pps signal. From the PRS10 user manual :

Locking to External 1pps

The PRS10 may be locked to an external 1 pps source (from a GPS or LORAN
receiver, for example) by applying a 1 pps pulse to the 1 pps input (pin 5 on the main
connector). A second order digital phase lock loop (PLL) is used to adjust the frequency

of the PRS10 to match the frequency of the 1 pps source over long time intervals.
---

73 Alberto I2PHD

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22. [tacgps] Re: GPS osc disciplining references

From: jim_johnson@agilent.com
Date: Thu, 13 Dec 2001 07:25:26 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51847-2001.12.13-09.53.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

    Interesting question (your algorithm question). We should pose
it to somebody who has developed one ... like Brooks!

    I wish Robin Giffard were here (deceased as of May, 2001)
to discuss these issues, especially as he has looked at GPS
data for years and would be able to give some insight as to
why the data never gets below 1E-12 after a long time. But,
there are other experts out here too that can probably answer
that question. I'm tempted to stick my uneducated neck out
and offer "multi-path" as a possible reason why somebody
taking data at any given location might not see numbers below
1E-12 in the long term, but if I do that I'll need to find my flack
jacket first ... so I won't do it.   :-)

Jim

> -----Original Message-----
> From: Tom Van Baak [mailto:tvb@leapsecond.com]
> Sent: Wednesday, December 12, 2001 1:05 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: GPS osc displining references
>
>
> > Hmmm, my "envelope" shows a drift rate of 3E-11/month yielding
> > about 86 ns/day/day, which makes the drift rate about 3 times
> > that of the daily noise, assuming the noise is averaged down to
> > about 30 ns/day. Am I off somewhere?
> >
> > Tnx,
> > Jim W6SC
>
> Yeah, that's more like it. My typo. 3E-11/month is
> 1E-12/day. Still, my guess is most Rb do quite a
> bit better than that spec and are down in parts in
> 10^13th per day. What happens to the algorithm
> when the daily drift rate is on the order of the daily
> noise?
>
> Interesting also to note the PRS10 plot shows GPS
> never getting below 1E-12 even after 2 weeks.
>
> /tvb
>

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23. [tacgps] Re: GPS osc disciplining references

From: "Brooks Shera" <ebs@lanl.gov>
Date: Thu, 13 Dec 2001 12:42:31 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51890-2001.12.13-14.11.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Don

Thanks for your thoughts on the disciplining business. I have a couple more
comments.

>
> Concerning the drift and the increased resolution, I don't think the drift
> is necessary. Certainly it increases the resolution of the measurement,
> after averaging. If the osc were perfect, or more practical, phase locked
> to the Rb, then the loop would track to the point where the transition of
> the 24 Mhz osc counter fell exactly at the 1 pps event. Without the
jitter
> on the 1 pps signal there would be a limit cycle that would be determined
> by the loop. With jitter, the limit cycle issue gets more complicated,
and
> I expect it becomes a secondary factor.
>
> What led me to this thinking was wrestling with the resolution of the HC11
> input-capture. I had an HC11 setup going about the same time you were
> working on your controller, where the micro clock input was driven by the
> Rb. At 10 Mhz, the input capture resolution is 400ns, which is rather
> course. The move and other life events put the project into the "think
> about" category. I had been pondering ways to improve this (and do so
> simply, e.g. faster micros, FPGAs, dither schemes,...), when it struck me
> that it is not all that important--the loop will stabilize with the 1 pps
> event coming exactly at the micro's bus cycle transition, so that the gps
> jitter will cause half of the events before and half after the micro's bus
> transition. The hardware is then "dog simple"--the Rb goes to the EXTAL
> input, and the gps goes to a input-capture pin.

Your "dog simple" scheme has not yet convinced this dog. If I understand
correctly, your arrangement would operate with a phase detector that
produces no information about the size of the phase error - its phase
detector needs only two output values, corresponding to phase leading or
phase lagging. How do you propose to operate a PI (or PID!) controller with
this limited input information?

>
> Another improvement might come from utilizing the 100 pps option with the
> Mot UT+. The specs say that the 1 pps can be switched to 100 pps, though
> I haven't tried this. The faster rate would help the averaging. The
price
> paid is that the feature is not as common as the 1 pps on other gps
engines.

I would agree, the 100 pps option would be useful if the UT+ solved the GPS
position/time equations 100 times per second and thus produced 100
independent time solutions. However, I believe the UT+ gps engine only
solves the equations once per second so the 99 extra output pulses present
no new information and averaging them is a waste of effort.

Brooks

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24. [tacgps] RE: N8UR

From: "Kirby, Brian" <Brian.Kirby@MSFC.NASA.GOV>
Date: Thu, 13 Dec 2001 23:06:31 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-51971-2001.12.13-23.35.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John you asked about a positioning survey with TAC32 a couple of
days ago. Here's the data I obtained. This is the average of 4 Oncore VPs.

        position deviation 2.97 meters lat, 2.88 meters long, 25.3 meters
height.

        My site is surveyed (carrier phase)/adjusted against NGS benchmarks
and after the averaging the above C/A data worked out to +2.52 meters north,
-1.08 meters east and -23.90 meters height.

25. [tacgps] Programming help for 5370B counter

From: "John R. Ackermann" <jra@febo.com>
Date: Sat, 15 Dec 2001 07:38:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-52134-2001.12.15-07.07.14--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Hi --

I'm just starting my first-ever foray into GPIB programming, trying to get frequency and time interval data out of my HP 5370B counter. I've cobbled together a working capture routine, but I don't think it's the most effective one to minimize dead time between readings.

I wonder if someone with experience in this area would be willing to work with me off-line to get the figured out.

Thanks!

John

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26. [tacgps] ANNOUNCE: New "time-nuts" mailing list for time/freq fanatics

From: "John R. Ackermann" <jra@febo.com>
Date: Sat, 15 Dec 2001 08:00:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-52140-2001.12.15-07.29.07--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've always felt a bit nervous about posting messages to the tacgps list that are more related to general time and frequency measurement than to GPS (like the posting I made a few minutes ago!).

I've talked for a few months with some other enthusiasts about setting up a separate mailing list for these more general issues.

I've decided to give it a try, so the "time-nuts@febo.com" mailing list is now available. The list charter says: "time-nuts@febo.com is a mailing list dedicated to the discussion of time and frequency measurement tools, techniques, and toys at a fairly serious level." Hopefully that's a useful description of what we're trying to accomplish.

You can subscribe by sending a message to "majordomo@febo.com" with the following as the only line in the body (without the quotes): "suscribe time-nuts". You can also subscribe via the web interface at http://www.febo.com/majordomo.html.

Subscription requests generate a confirmation email that you'll have to return (that avoids prank subscriptions), and to minimize spam posting is limited to subscribed addresses. That last point means that if you subscribe using an alias like "n8ur@tapr.org" you will not be able to post unless your mail program is set up to show the same address in either the "From" or the "Reply-to" headers of messages you send. To avoid problems, I suggest that you subscribe using your real email address and not an alias.

All list messages are available in a searchable archive at http://www.febo.com/list-archive.

I want to be clear about one thing: this new list is in no way intended to displace or replace the tacgps list, which has got to be one of the highest SNR lists of all time. The idea is simply to have a place to take broader discussions.

Enjoy!

John N8UR
jra@febo.com

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Re: GPS osc displining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Tue, 18 Dec 2001 11:01:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-52586-2001.12.18-10.30.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This is a re-post. It's been a week and I didn't see it on the list.

Don

>
>Brooks,
>
>Good comments that stimulated my thinking!
>
>>The controller does use a 2nd order loop, primarily because such a loop in
>>unconditionally stable.
>
>And a very good choice for a general purpose controller.
>
>BTW, after doing some simulations for another home project, (steering the
time keeping on my "gizmo's" on my RS-485 network), I discovered that with
a digital implementation, a second order loop is NOT unconditionally stable
for all gains. It took me a while to understand what was happening, as I
was also of the thinking that the second order loop was unconditionally
stable. (In fact, that's why I emailed you about the source code--I
couldn't figure out what I was doing wrong.) What happens is that at high
gains the loop frequency (which increases with gain) can reach the point
where the approximations for the digital filter fall apart, or put another
way, the loop frequency was getting too close to the sampling frequency--a
situation that would not be a problem in the gps osc steering situation,
but something my simulations for the "time keeping" ran into (where getting
on-time quickly was a big consideration).
>
>>Higher order loops can readily oscillate if the
>>loop gain is not set carefully (see Gardner p.18).
>
>The unstable region is for low gains. Above that, the loop remains stable
for all gains, so it doesn't look so critical for the phase-locked loop
situation.
>
>>But really, there is little
>>to be gained by going to a 3rd order loop.
>
>It looks like there are advantages to the 3rd order loop. The 3rd order
loop has "memory" for rate of change of freq, whereas the 2nd order loop
holds just frequency (p51,52 (BTW it looks like your p18 corresponds to p16
in my old, yellowed book)). Blanchard, _Phase-Locked Loops: Application to
Coherent Receiver Design_, 1976 (pages aren't quite so yellow!), shows that
the 3rd order loop is optimum in the presence of noise, when the
disturbance is a frequency ramp (the cool breeze through the window syndrome).
>
>>Don's comment that a ramping
>>VCXO frequency will cause a FREQUENCY error in a 2nd order loop is
>>misleading. It actually causes a PHASE offset (see Gardner, Table 4.1) .
>>This phase offset is of little importance for a frequency standard that is
>>operating with a reasonably stable VCXO.
>
>Quite true for the *steady state*. However, for discipling the osc, the
problem is dealing with change, e.g. the daily temp fluctuations are the
major cause of Rb drift (I found an article that showed a graph and made
this statement). One could approximate this error input as a sine wave
with a 24 hour period. The task is to come up with a loop design that
minimizes the error. It seems like the "noises" are the key factor in the
loop design, and that's where I bog down (it's been 40 yrs since my last
grad level course on this, so I'm a bit rusty).
>
>The whole issue revolves around the "reasonably stable VCXO"--it is that
instability that we are trying to reduce. Gardner's chapt on optimization
talks about Wiener optimization; Blanchard uses it too. I suspect that
Wiener or Kalman filtering might be the area of references I need to pursue.
>
>>As explained in the article, drift of the inexpensive 24 MHz xtal osc is
>>*essential* to overcoming the +/- 1 count ambiguity in the phase measuring
>>circuit. If the 24 MHz osc were looked to the VCXO the count ambiguity
>>would cause a phase error of +/- 42 nsec. Drift of the 24 MHz xtal reduces
>>the error to a small fraction of this amount. Also, the effect of the drift
>>of even a cheap xtal on the phase setpoint is negligible.
>
>After revisiting the setpoint changing issue it is now looking like it is
not a major factor. If the setpoint were at 1000 counts (of the 24 Mhz
counter) and there is a change of 10 ppm of the 24 Mhz osc, then there is a
shift of the setpoint of .01 counts, out of a total one second count of
24E6, which translates to 4.2E-10 counts per one second interval. If it

takes 1000 seconds for the 24 Mhz osc change, then the rate of shift is
about 4.2E-13 cycles per second. Since the Rb appears--at best--stable in
the 1E-12 to 1E-13 realm, then 4.2E-13--at worst--is not going to ruin the
results. I was off by two orders magnitude on my earlier estimate.
>
>Concerning the drift and the increased resolution, I don't think the drift
is necessary. Certainly it increases the resolution of the measurement,
after averaging. If the osc were perfect, or more practical, phase locked
to the Rb, then the loop would track to the point where the transition of
the 24 Mhz osc counter fell exactly at the 1 pps event. Without the jitter
on the 1 pps signal there would be a limit cycle that would be determined
by the loop. With jitter, the limit cycle issue gets more complicated, and
I expect it becomes a secondary factor.
>
>What led me to this thinking was wrestling with the resolution of the HC11
input-capture. I had an HC11 setup going about the same time you were
working on your controller, where the micro clock input was driven by the
Rb. At 10 Mhz, the input capture resolution is 400ns, which is rather
course. The move and other life events put the project into the "think
about" category. I had been pondering ways to improve this (and do so
simply, e.g. faster micros, FPGAs, dither schemes,...), when it struck me
that it is not all that important--the loop will stabilize with the 1 pps
event coming exactly at the micro's bus cycle transition, so that the gps
jitter will cause half of the events before and half after the micro's bus
transition. The hardware is then "dog simple"--the Rb goes to the EXTAL
input, and the gps goes to a input-capture pin. (The setpoint issue also
goes away.)
>
>Another improvement might come from utilizing the 100 pps option with the
Mot UT+. The specs say that the 1 pps can be switched to 100 pps, though
I haven't tried this. The faster rate would help the averaging. The price
paid is that the feature is not as common as the 1 pps on other gps engines.
>
>Anyway, that's where I'm at with it. If you run across some good
references I'd appreciate if you would send them to me.
>
>Don, W4DH
>

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28. [tacgps] Re: Fw: Re: GPS osc disciplining references

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Wed, 19 Dec 2001 16:12:49 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-52759-2001.12.19-15.43.11--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

Thank you for sending a direct response, as I did miss your reply.
Apparently my posts are getting through, but I haven't seen any TAPR email
from any of the lists for the last 8 days. I'll try once more with this post.

>> Your "dog simple" scheme has not yet convinced this dog. If I
>understand
>> correctly, your arrangement would operate with a phase detector that
>> produces no information about the size of the phase error - its phase
>> detector needs only two output values, corresponding to phase leading
>or
>> phase lagging. How do you propose to operate a PI (or PID!) controller
>with
>> this limited input information?

This is the classic "bang-bang" servo. The earlier texts on automatic
control covered them, as control loops with relay switching of motors was
common. Now, semiconductors can drive huge loads. Kuo doesn't talk about
them in his book.

The size of the phase difference comes from the averaging. With the HC11
steps are 400 ns, so some means of increasing the resolution is needed.
With your scheme the step is 42 ns and averaging is used (to attempt) to
increase the resolution as well (more on this later).

I think in both schemes that, theoretically, the loop ends up in a limit
cycle, the natural outgrowth of being digital. Practically, with

osc-counter scheme in your design, the cycle would be masked by the 24 Mhz osc drift, and jitter on the 1 pps. With the dog-simple scheme, I think the limit cycle problem is complicated by "multiple modes." If the loop holds the phase difference sufficiently close to zero, such that the 1 pps jitter has a some pulses fall on the "other side" of the bus transition, after averaging (which takes place automatically as a result of the low loop frequency), the result is truly proportional. If there is a region of operation where the the all the 1 pps events fall within the same bus transition, then the average difference is simply 1 (saturation type of mode). For large phase differences the input capture is proportional, where the smallest step is 1 part in 2.5E6 (i.e. 400 ns steps). This gives rise to a multimode loop; one of my books mentions the concept briefly.

Of course a faster micro would reduce the course resolution problem. A friend has a couple of abandoned prototype boards from his work with 68332 processors; the manual on the TPU says the input-capture resolution is 1 clock (not bus) cycle, and the clock on these units is 16 Mhz, and the newer 68xxx units go up to 25 Mhz. Such a unit would not easily be reproduced by others, however. Motorola's HC12 offers a 4x improvement over the HC11, partly because the bus operates at 1/2 the clock rather than 1/4. The Scenix micro boasts a 50 Mhz clock, and it is cheap, but after looking at the specs the input-capture resolution is far less as it takes place in software rather than hardware.

The drift issue of the 24 Mhz osc still bothers me with your scheme. I don't think there is "averaging" as you expect under all conditions. Suppose that the 24000000 Hz osc is is off-frequency "by a hair"--which will occur often. This essentially generates a less-than-1-Hz beat frequency with the 1 pps--each 1 pps occurs at slightly different phase position with respect to the 24 Mhz osc. If that beat frequency is well above the controller loop cutoff, then it serves as dither signal and the effect is increased resolution due to averaging. If that beat frequency is low then it will cause slow, periodic 42ns phase shifts; the averaging will not take it out. This effect will occur as the 24 Mhz changes frequency due to temp cycling, and would occur as the osc passes through each integral 1 hz cycle off freq, e.g. 24000001, 24000002,... The worst case would be if the room temp is relatively stable so that the freqency changes very slowly, allowing long periods where the 42 ns shifts affect the loop. Phase locking eliminates that effect, but increases the hardware complexity...which brings me back to the direct driven micro scheme.

At first it looked like the jitter on the 1 pps signal would takes care of the problem, but as I think it through I believe the problem remains. The loop will drive the phase to zero difference between that measured and the setpoint, i.e. coincide with a transition of the 24 Mhz osc--a 42 ns osc-counter version of the 400 ns dog-simple scheme. Now the 24 Mhz drifts every so slightly, the measurement then shifts so that it is one count different, which in turn affects the loop output. At the present, I don't know the size of the effect.

>> independent time solutions. However, I believe the UT+ gps engine
>only
>> solves the equations once per second so the 99 extra output pulses
>present
>> no new information and averaging them is a waste of effort.

An interesting point worth some investigation. It depends on where the phase-locking and jitter in the gps engine take place. I was under the impression that the 1 once per second solution had to do with the navigation parameters and the phase locking was a necessary part of the signal acquisition. If the jitter is independent of the once-per-second-update, then the 100 pps is not wasted as it serves to increase the measurement resolution due to the coarse (400 ns) step.

Don

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29. [tacgps] Re: Fw: Re: GPS osc disciplining references

From: "Brooks Shera" <ebs@lanl.gov>
Date: Thu, 20 Dec 2001 12:19:19 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-52883-2001.12.20-13.47.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Don

I agree that your two-state phase detector produces the "classic" bang-bang servo loop. I suspect that time has passed by this design because it is hard to predict how it will perform in the real world due to it's multiple modes, as you suggest. I guess that even in its "proportional" mode it would be merely a type I controller.

Regarding your desire to put the phase detector entirely within the microprocessor: I still fail to see your motivation here since a faster and more flexible system requires only an R/S flip-flop and an oscillator chip of whatever freq you desire. I choose 24 MHz because it was $5 from DigiK and had a divided output to clock the PIC. If you want, you could go to a higher frequency, though I don't feel it is necessary.

Your discussion of the averaging process is correct, I think, but the concerns you raise seriously overestimate the stability of the cheap 24 MHz chip. For the 24 MHz osc to stay within 42 nsec of the 1 pps (and thereby destroy the averaging) for periods the order of the integration time of the loop, say 1 hour, would require a stability for this $5 chip of 1.1e-11! However, even if we found such a little gem of an xtal, there are a least two other jitter sources that will produce the needed averaging. One is GPS jitter, with SA on, it was about 40 nsec and is now about 20 nsec. But an even larger jitter is caused by the 104 nsec peak-to-peak timing sawtooth from the Oncore receiver. The sawtooth is produced because the Oncore outputs the 1 pps by gating out the "closest" pulse from a 9.5 MHz internal clock. This sawtooth averages to a mean value of zero over a minute or so, as has been discussed here in the past. Presumably the average quickly approaches zero because the 9.5 MHz clock is not phase-related to the computed 1 pps time. Does this scheme sound familiar?

Regards the 100 pps output: I haven't made any measurements on this, nor heard of any, but I would guess the 99 extra pulses are produced by selecting pulses from the pulse stream from the 9.5 MHz clock, based on GPS time as computed by the receiver at the previous 1-second epoch. If this is the case, they would probably show the same 104 nsec sawtooth, but with shifting time error (phase of the sawtooth) as you progress through the 100 pulses. So sampling on all these pulses would not reduce the GPS timing jitter, but it would cause the sawtooth to average to zero faster, if that were important. Which it is not.

Brooks

----- Original Message -----
From: "Donald E Haselwood" <dhaselwood@ij.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Wednesday, December 19, 2001 14:12 PM
Subject: [tacgps] Re: Fw: Re: GPS osc disciplining references

> Brooks,
>
> Thank you for sending a direct response, as I did miss your reply.
> Apparently my posts are getting through, but I haven't seen any TAPR email
> from any of the lists for the last 8 days. I'll try once more with this
post.
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>
> Don

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30. [tacgps] Re: US$20 GPS - Report

From: Rick Gilligan <rick@case.net>
Date: Fri, 28 Dec 2001 14:25:29 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-53909-2001.12.28-16.54.35--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Mon, 12 Feb 2001, Darryl Smith wrote:

> These units will fail to lock onto GPS when you move them significant
> distances very quickly, such as when you fly one from Australia to the USA
> powered down, but with the battery backup attached. Quickly removing the
> battery backup with the unit powered down will reset the unit, allowing the
> GPS to seach the sky for satellites.
>
> I think that the way this unit works is that it assumes that cars do not
> drive 8,000 miles in 12 hours, and therefore is using all the computing
> power to search the sky where it thinks it is, rather than spending some
> time also searching for other satellites. This makes sense because the unit
> has very good performance in even areas where part of the sky is obscured,
> and re-acquired very quickly

I'm responding to an old message, but my symptom was the same with a
Motorola GT+ receiver (I believe it has 2.01 firmware). Flew from
California to New Zealand, left it on three days. Only found one or
two satellites which were visible both from California and New Zealand.

After three days, never got a lock. Hadn't brought the proper software
to re-initialize it, also didn't have Internet access to look up the
commands to re-write the code.

Not a good thing... the receiver knew the current GPS time, had a valid
almanac (and could load new almanacs from the one or two co-visible
satellites). It isn't easy to short out the soldered-in battery (nor
probably a very good thing to do).

73
Rick
N6NL

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31. [tacgps] Using the PECL level outputs in the Z3801A?

From: "John R. Ackermann" <jra@febo.com>
Date: Sat, 29 Dec 2001 13:40:37 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54053-2001.12.29-13.09.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Has anyone else had challenges using the 1pps and 10MHz pseudo ECL outputs
on the Z3801A's DB-25 connector? I find that triggering off of these
signals is fairly tricky and am wondering if I'm alone in that. I've been
thinking about whether a PECL to TTL adapter might be a good idea.

John

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32. [tacgps] Re: Using the PECL level outputs in the Z3801A?

From: Doug Bade <doug@clecom.com>
Date: Sat, 29 Dec 2001 13:46:38 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54054-2001.12.29-13.17.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I had not tried, I am using 10mhz only at this time... What seems
to be the nature of the challenge??? Doug KB8GVQ

At 01:40 PM 12/29/2001 -0500, you wrote:
>Has anyone else had challenges using the 1pps and 10MHz pseudo ECL outputs
>on the Z3801A's DB-25 connector? I find that triggering off of these
>signals is fairly tricky and am wondering if I'm alone in that. I've been
>thinking about whether a PECL to TTL adapter might be a good idea.
>
>John
>---
>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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January 2002

Original source file: tacgps.0201
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0201

1. [tacgps] NTP Requirements.

From: xaos <xaos@darksmile.net>
Date: Wed, 02 Jan 2002 16:06:58 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54705-2002.01.02-15.36.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello everyone,

I am a bit confused about what it takes to get
the TAC2 working under Linux and NTP.

First, do I need the PPS kit?
I have NTP version 4.0.99k23. It seems that if I use the PPSkit
I will have to re-compile NTP.

What's the difference between ntp and xntp?

Can I use NTP and still get the GPS data from TAC2?
Can I also communicate (send messages to the TAC2) when
I use NTP.

Can someone provide me with a valid ntp.conf using tha TAC2?

I am just a bit overwhelmed with info right now. Please excuse
my stupid questions.

Thanks in advance,
George Hrysanthopoulos, N2FGX

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2. [tacgps] Change of Address test

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Wed, 2 Jan 2002 16:35:23 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54711-2002.01.02-16.04.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I switched ISPs -- new Email address is mailto:w3iwi@toad.net.

This is a test to verify that TACGPS made the change ok.

73 and Happy New Year de Tom, W3IWI

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] RE NTP Requirements.

From: "Gary J. Myers" <gary@geekslounge.com>
Date: Wed, 02 Jan 2002 15:45:14 z (???)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54730-2002.01.02-18.08.41--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Tell me if I am wrong but I thought you cannot connect a TAC2 to a *NIX box or UNIX flavors. I was thinking of porting a clone of Showtime or TAC32 over to BSD UNIX becuase of this notion. I would much rather run my TAC2 on my FreeBSD box instead of a windoze box.

Gary

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> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Date: Wed, 02 Jan 2002 16:06:58 -0500
> Subject: [tacgps] NTP Requirements.
>
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> You are currently subscribed to tacgps as: gary@geekslounge.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Re: RE NTP Requirements.

From: "John R. Ackermann" <jra@febo.com>
Date: Wed, 02 Jan 2002 19:07:34 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54740-2002.01.02-18.36.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

There are at least three ways you can use the TAC-2 with a Linux/BSD/*nix
box, at least if you're willing to run the NTP daemon:

1. Use the Oncore reference clock driver built into recent versions of
ntpd. This provides very good performance, but talks to the Oncore in
Motorola binary format at 9600 bps, and interrogates the GPS once per
second, so it doesn't work too well with other simultaneous uses of the
TAC-2.

2. Use the NMEA driver, which doesn't (in unpatched mode) provide 1pps
accuracy. However, you can use the patched version at my web site
(http://www.febo.com/time-freq/ntp) to get 1pps accuracy. This uses the
standard 4800 bps NMEA strings, and doesn't talk to the GPS (i.e., it just
turns on the necessary sentences and then sits back and listens).

3. You can ignore the serial data entirely, and just use the 1pps signal
to determine the second marker, while using another ntp server to provide
the actual date/time.

Hope this helps.

73,

John N8UR
jra@febo.com

--On Wednesday, January 02, 2002 3:45 PM +0000 "Gary J. Myers"
<gary@geekslounge.com> wrote:

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>> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
>> Date: Wed, 02 Jan 2002 16:06:58 -0500
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You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] Re: RE NTP Requirements.

From: "John R. Ackermann" <jra@febo.com>
Date: Wed, 02 Jan 2002 19:09:34 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54741-2002.01.02-18.38.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

See addition below...

--On Wednesday, January 02, 2002 7:07 PM -0500 "John R. Ackermann"
<jra@FEBO.COM> wrote:

> 3. You can ignore the serial data entirely, and just use the 1pps signal
> to determine the second marker, while using another ntp server to provide
> the actual date/time.

I forgot to say that this requires using the "ATOM" reference clock driver
in ntpd.

John

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>>>
>>> Can someone provide me with a valid ntp.conf using tha TAC2?
>>>
>>> I am just a bit overwhelmed with info right now. Please excuse
>>> my stupid questions.
>>>
>>> Thanks in advance,
>>> George Hrysanthopoulos, N2FGX
>>>
>>>
>>>
>>> ---
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6. [tacgps] Re: Change of Address test

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Thu, 03 Jan 2002 15:56:18 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54937-2002.01.03-16.22.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Happy New Year, yourself! Are you going to the ION National Meeting?
Anyone else from the SIG going? I'm currently planning on a short trip
out there.

Gerry
--
"Tom Clark (W3IWI)" wrote:
>

> I switched ISPs -- new Email address is mailto:w3iwi@toad.net.
>
> This is a test to verify that TACGPS made the change ok.
>
> 73 and Happy New Year de Tom, W3IWI
--
Gerry Creager
AATLT/Network Engineering
Texas A&M University
979.458.4020 (Phone)   979.847.8578 (FAX)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: Change of Address test

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Thu, 3 Jan 2002 19:27:33 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-54965-2002.01.03-18.57.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Nope -- I won't be there. But I do have some really neat new stuff to spring
on y'all!

> -----Original Message-----
> From: bounce-tacgps-25677@lists.tapr.org
> [mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of Gerry Creager
> N5JXS
> Sent: Thu, January 03, 2002 16:56
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: Change of Address test
>
>
> Happy New Year, yourself! Are you going to the ION National Meeting?
> Anyone else from the SIG going? I'm currently planning on a
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> out there.
>
> Gerry
> --
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> >
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> >
> > This is a test to verify that TACGPS made the change ok.
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> > 73 and Happy New Year de Tom, W3IWI
> --
> Gerry Creager
> AATLT/Network Engineering
> Texas A&M University
> 979.458.4020 (Phone)   979.847.8578 (FAX)
>
> ---
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>

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8. [tacgps] How accurate an Oscillator?

From: "Steven Bible" <n7hpr@tapr.org>
Date: Wed, 9 Jan 2002 08:44:52 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-56162-2002.01.09-10.11.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My personal studies have shifted to crystals, oscillators and PLLs. So it
was a natural to look at W5OJM's article.

I have everything built up and initially I am trying to discipline a
low-cost VC-TXO that I bought from Digi-Key (I have a Rb and oven

oscillators coming later). It is made by ECS Inc. and their PN is
VC-TXO-39SM-100. It is 10 MHz. The data sheet is available from ECS web
site. I wanted to investigate this oscillator for my DSP-10.

Since Sunday I have been trying to discipline this oscillator. The ASCII
data and subsequent graphs show the DAC voltage in a saw-tooth pattern over
several hours. This is in Mode 2. Mode one the DAC voltage is steady.

Last night I revisited the set-up of R5 and R6. The values now are R5 = 330
ohms and R6 = 220K ohms. S for this oscillator is 1.105 x 10e-5. The
change in frequency over 1 volt is 110.5 Hz. I suspect that this is too
much for the algorithm that Brooks' has programmed. I read that Rd and Oven
Oscillators have a much lesser S with 5 volts changing only 1 Hz.

I have not installed a second 4250 counter.

I'll surely understand more when the Rd and oven oscillators arrive and I
can hook them up and see. But I wanted to post a note to the list and get
some ideas from the group as to what is happening here. I am curious as to
how low an accuracy, or rather, how large and S can be used to discipline
and oscillator? Any ideas?

- Steve, N7HPR
  (n7hpr@tapr.org)

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9. [tacgps] RE: How accurate an Oscillator?

From: Ian Roberts <ITR@nanoteq.com>
Date: Thu, 10 Jan 2002 10:37:18 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-56344-2002.01.10-03.07.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve, my experiences with a similar setup may be of interest.

The oscillator is a 10 MHz Ovenaire Precision Oscillator TTL output with a
40 second spec'ed stability of around exp-8.
In native form the suggested voltage tuning network will not work - the
controller bounces from end-stop to end-stop (in voltage terms).
The work-around was to place a series resistor of around 18K in series with
the 5v tuning voltage, and around 4 Mega Ohm between the wiper of the tuning
pot and the voltage tuning pin of the oscillator. This reduces the supply
voltage at the tuning pot to below 1v and the total tuning range of the
oscillator is then around 40 Hz (from the previous ~300Hz). This is a long
way off Brooks' example of 1 Hz/10v with the HP oscillator. R5 and R6 are
minimum values - the Analogue Devices DAC I'm using is capable of an
indefinite period short on the DAC output, but to keep thermal cycling low
maintain about 800-1000 ohms as suggested. A second frequency divider is
used to bring the 10 MHz down (to around 78 kHz).
The GPS OEM is a Trimble ACE.

In N=2 this oscillator provides around 4x exp-10 with my measurement setup,
which is pure ham, and is compared to the SABC's on-air rubidium on ch 13
(247.456030 MHz) - I use a harmonic of the osc as I cannot measure to
exp-10/11 at 10 MHz.

It is interesting to note that a phase error of more than about 10 ns has
measurable influence on the frequency of the osc, for this reason I wait
until the phase error is 5 ns or less in N=2, then take the frequency which
compares well with the rubidium.

There has been some debate on this reflector regarding 2nd and 3rd order
control loops. In N=3 the average phase error increases and the osc spends
much more time way off the required frequency, so in my opinion when using
cheap oscillators anyway, the longer constants greatly reduce the system's
accuracy. In N=4 the system unlocks.

After a power failure my system manages to find its feet again, without
intervention.

Also, determination of the actual frequency is a problem in the absence of
another reference standard. Brooks did not enlarge on how to do this in his
article, but in subsequent correspondence told me that each DAC unit = 92
uv. From this it seems one needs to translate the oscillator's tuning curve

in volts/Hz to DAC units and transpose these to the 800 ns set point (for the latter software version), then its no-mans land.

Cheers,
Ian ZS6BTE

-----Original Message-----
From: Steven Bible [mailto:n7hpr@tapr.org]
Sent: 09 January 2002 05:45
To: TAPR Special Interest Group
Subject: [tacgps] How accurate an Oscillator?

My personal studies have shifted to crystals, oscillators and PLLs. So it was a natural to look at W5OJM's article.

I have everything built up and initially I am trying to discipline a low-cost VC-TXO that I bought from Digi-Key (I have a Rb and oven oscillators coming later). It is made by ECS Inc. and their PN is VC-TXO-39SM-100. It is 10 MHz. The data sheet is available from ECS web site. I wanted to investigate this oscillator for my DSP-10.

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Last night I revisited the set-up of R5 and R6. The values now are R5 = 330 ohms and R6 = 220K ohms. S for this oscillator is 1.105 x 10e-5. The change in frequency over 1 volt is 110.5 Hz. I suspect that this is too much for the algorithm that Brooks' has programmed. I read that Rd and Oven Oscillators have a much lesser S with 5 volts changing only 1 Hz.

I have not installed a second 4250 counter.

I'll surely understand more when the Rd and oven oscillators arrive and I can hook them up and see. But I wanted to post a note to the list and get some ideas from the group as to what is happening here. I am curious as to how low an accuracy, or rather, how large and S can be used to discipline and oscillator? Any ideas?

- Steve, N7HPR
  (n7hpr@tapr.org)

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10. [tacgps] RE: How accurate an Oscillator?

From: Diane Foray and Jeff Vollin <barnie@flash.net>
Date: Thu, 10 Jan 2002 07:02:39 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-56364-2002.01.10-08.32.19--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My experience with trying to disciple a low cost oscillator indicate it is not worth the effort. I ran a setup using a Rakon 10 MHz TCXO for several months. The DAC output as well as the Phase output from Brooks' controller both looked like sine waves in direct correlation with the average temperature of the room day to night. If I switched on some overhead track lights, the loop would unlock. The only way to get the loop to stay locked was to do something to isolate the crystal from the local thermal environment. If I turned on the air conditioning in the room, the loop would unlock almost immediately after the start of a cooling cycle. My room is in Arizona, in the basement of a brick house. The wall near the workbench is above grade and the sun hits it in the afternoon, so the day-night temperature excursion is about 3-4 deg F without the A/C.

I think the controller was successful keeping the crystal frequency on target, when averaged over a long period (say several days) but the short term errors were pretty large. The phase output had about a 300 nS p-p sinewave on it. Eventually, I gave up and switched to an OCXO, an HP 10811 in a 5370 time interval counter. Even this oscillator shows evidence of toom temperature effects if you look at the DAC output. The phase is pretty flat thanks to the

controller's loopgain. I plan on finding a double-oven OCXO before I call this project complete.
  I found N=3 had the lowest phase errors with the Rakon. I don't know the exact shape of the loopgain, but I expect that loop may have higher loopgain for frequencies associated with a 24 hour period, while still maintaining adequate bandwidth to not experience non-linear effects, such as saturation of the control signal. Higher N's were prone to losing lock, and never recovering.

Jeff Vollin

> From: Steven Bible [mailto:n7hpr@tapr.org]
> Sent: 09 January 2002 05:45
> To: TAPR Special Interest Group
> Subject: [tacgps] How accurate an Oscillator?
>
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> was a natural to look at W5OJM's article.
>
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> I have not installed a second 4250 counter.
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> - Steve, N7HPR
>   (n7hpr@tapr.org)
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11. [tacgps] RE: How accurate an Oscillator?

From: "Kenneth Lerman" <Kenneth.Lerman@se-ltd.com>
Date: Thu, 10 Jan 2002 18:34:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-56481-2002.01.10-18.02.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Years (actually decades) ago, I remember seeing an article that suggested a cheap way to maintain a fairly constant temperature.

Take a post hole digger and bury the oscillator as deep in the ground as you can put it.

Ken

-----Original Message-----
From: bounce-tacgps-23240@lists.tapr.org
[mailto:bounce-tacgps-23240@lists.tapr.org]On Behalf Of Diane Foray and Jeff Vollin
Sent: Thursday, January 10, 2002 9:03 AM

To: TAPR Special Interest Group
Subject: [tacgps] RE: How accurate an Oscillator?

My experience with trying to disciple a low cost oscillator indicate it is not worth the effort. I ran a setup using a Rakon 10 MHz TCXO for several months. The DAC output as well as the Phase output from Brooks' controller both looked like sine waves in direct correlation with the average temperature of the room day to night. If I switched on some overhead track lights, the loop would unlock. The only way to get the loop to stay locked was to do something to isolate the crystal from the local thermal environment. If I turned on the air conditioning in the room, the loop would unlock almost immediately after the start of a cooling cycle. My room is in Arizona, in the basement of a brick house. The wall near the workbench is above grade and the sun hits it in the afternoon, so the day-night temperature excursion is about 3-4 deg F without the A/C.

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Jeff Vollin

> From: Steven Bible [mailto:n7hpr@tapr.org]
> Sent: 09 January 2002 05:45
> To: TAPR Special Interest Group
> Subject: [tacgps] How accurate an Oscillator?
>
> My personal studies have shifted to crystals, oscillators and PLLs. So it
> was a natural to look at W5OJM's article.
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> - Steve, N7HPR
>   (n7hpr@tapr.org)
>
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You are currently subscribed to tacgps as: Kenneth.Lerman@se-ltd.com
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12. [tacgps] How accurate an Oscillator?

From: Dan Hinz <dan.hinz@ieee.org>
Date: Fri, 11 Jan 2002 22:29:38 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-56795-2002.01.12-00.59.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Steve-

Symptoms sound like what I suffered from. Mode 1 appeared normal, Mode
2 I got a saw tooth that drove to the rail and then reset to 0. The
cycle repeated in 4.13 hours or 10x the filter constant of 1500 seconds.

When I went to mode 3, the problem continued with a longer period that I
estimated at about 14.5 hours. (I didn't wait for a full cycle to
figure it out, merely looked at the slope)

The response I got back from Brooks was that I was either picking up a
bunch of noise or else "way" off frequency. "way" being a relative
term, I was actually off almost 2Hz. I had another stable time base
that I used as a "reference" to get to the right frequency. I wrote
everything down so that I could get back to where I was if need be. The
other OCXO was not locked to GPS, I just kept it powered up. Once I got
the disciplined oscillator locked to GPS for several days, I then set my
"reference" to the correct frequency.

I used the 1.33 PIC software that has the phase difference output
available for monitoring via an analog meter. Here is the text of my
message to Brooks after I finally locked on...
Good luck,
Dan

Brooks-

I installed a 10pF cap on the input, then ran out to an end of the year
soccer party for my 6 year old. I collected data for several hours. I
still had a random number but the average was around 600 as opposed to
~715 . So I
figured I'd check the frequency. As you suspected, I was way off
frequency, nearly 2Hz! That was a 1 hour test of patience to get on
frequency. I set it, went to mode 2 and then to bed. I analyzed the
data this morning and it looks great!

Max difference in phase from one reading to the next is 87 (120nS) with
an
average of 8.5 (11.8nS) The controller is averaging an actual phase
number
of 795, the stdev is 35.

Thanks for all your help. This is a great project!

73,
Dan - W6LSN

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13. [tacgps] RE: How accurate an Oscillator?

From: "Steven Bible" <n7hpr@tapr.org>
Date: Sun, 13 Jan 2002 18:32:44 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-57199-2002.01.13-19.58.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks to everyone who replied. All great information which was most
helpful. Here's what I have discovered so far.

The output of U3 pin 15 was way too jittery. I was trying to do as Brooks
instructed to look at the pulse width to get the frequency as close as
possible. So there must be some noise somewhere.

I found that I did not have a good match between the VC-TXO and the HCT4046
phase detector input. I found this problem by measuring the frequency of
the PD output. It was not 10 MHz, it was something less. In fact, it
varied. So I made a direct connection from the VC-TXO output to the PD
input and now there's a 10 MHz output of the PD. Once I did this the output
of U3 pin 15 was much more stable. I was able to adjust the frequency
phase. Before, the low/high LEDs would flicker a bunch (no wonder), now
they were much more stable and the frequency was easier to adjust.

I was able to get the pulse width stable and close to frequency. I then put
the device in Mode 2. As I watched, things looked good. That was yesterday
and today I found from the ASCII data that there was a close lock for about
3-4 hours. Then the DAC output appeared to hit the top rail and then
started saw-toothing (if that's a word :-). A little while ago it appears
to found a lock again. I suspect temperature has a role here. The high
today was 74 degrees in Phoenix (just had to throw that in there :-). So I
suspect I am not in the middle of the EFC range. I'll need to go back and
look at values of Ra and Rb again. Plus, since this oscillator is also a
TXO, there might an influence not desirable for the loop filter of the W5OJM
device.

I'll keep an eye on it for the moment. I still need to look at noise on the
supply voltage (I am using a wall wart) and try a second 4250 counter to
divide down the 10 MHz by 32 instead of 16 as I am now.

Me thinks to really assess how low-cost oscillators will perform when
disciplined by GPS is to get a more accurate reference up and running to
compare with. I have a Rb now that I'll get connected up and use it as my
reference. Then I'll compare the accuracy of the ECS VC-TXO that I have now
and hopefully other VCXOs that I can try.

More to follow...

- Steve, N7HPR
  (n7hpr@tapr.org)

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14. [tacgps] GPS Distribution amplifier

From: xaos <xaos@darksmile.net>
Date: Thu, 24 Jan 2002 08:24:35 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58873-2002.01.24-07.54.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello everyone,

I need to split the GPS signal from the TAC2 so I can feed a second
GPS receiver. Some GPS distribution amplifiers I found,
were very expensive ($300-$400 range).

I also found a unit on sale at Ebay for ~$150.00.
This one is a HP 58535A. Does anybody have info on this unit?

I was wondering if there is another way to do this. Basically
the problem arises from the fact that GPS receivers provide power
to the antenna. I can't just combine the signals since I would

damage the units.

Has anyone here addressed this problem?

Thanks,

-George Hrysanthopoulos, N2FGX

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] Re: GPS Distribution amplifier

From: John Ackermann N8UR <jra@febo.com>
Date: Thu, 24 Jan 2002 08:36:27 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58877-2002.01.24-08.06.45--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

--On Thursday, January 24, 2002 8:24 AM -0500 xaos <xaos@darksmile.net>
wrote:

> Hello everyone,
>
> I need to split the GPS signal from the TAC2 so I can feed a second
> GPS receiver. Some GPS distribution amplifiers I found,
> were very expensive ($300-$400 range).
>
> I also found a unit on sale at Ebay for ~$150.00.
> This one is a HP 58535A. Does anybody have info on this unit?

I bought one of the HP-58535As off eBay for about $100 (lucky I guess). It
works fine. It has N connectors all around.

You can also build a cheap but effective splitter/amplifier using DSS
satellite TV components from Radio Shack; there've been a couple of
messages on the list with a pointer to a web site with info on the bits and
pieces to use, but I can't find the ##$%#@@#@ URL right now.

73,
John

John Ackermann N8UR jra@febo.com http://www.febo.com
President, TAPR n8ur@tapr.org http://www.tapr.org

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16. [tacgps] Re: GPS Distribution amplifier

From: xaos <xaos@darksmile.net>
Date: Thu, 24 Jan 2002 08:50:08 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58878-2002.01.24-08.20.24--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

John,

That sounds great. I feel much better since you have already tested the
HP unit.
I just didn't want to take a chance on damaging my TAC2 or my antenna.

Your second suggestion on using DSS satellite TV components: I wonder if
that splitter
supports powered antennas or passive ones. Again I am worried about
damaging something.

73,
George

John Ackermann N8UR wrote:

> --On Thursday, January 24, 2002 8:24 AM -0500 xaos

> <xaos@darksmile.net> wrote:
>
>> Hello everyone,
>>
>> I need to split the GPS signal from the TAC2 so I can feed a second
>> GPS receiver. Some GPS distribution amplifiers I found,
>> were very expensive ($300-$400 range).
>>
>> I also found a unit on sale at Ebay for ~$150.00.
>> This one is a HP 58535A. Does anybody have info on this unit?
>
>
> I bought one of the HP-58535As off eBay for about $100 (lucky I
> guess). It works fine. It has N connectors all around.
>
> You can also build a cheap but effective splitter/amplifier using DSS
> satellite TV components from Radio Shack; there've been a couple of
> messages on the list with a pointer to a web site with info on the
> bits and pieces to use, but I can't find the ##$%#@@#@ URL right now.
>
> 73,
> John
>
>
> ----
> John Ackermann   N8UR   jra@febo.com   http://www.febo.com
> President, TAPR   n8ur@tapr.org   http://www.tapr.org
>
>
> ---
> You are currently subscribed to tacgps as: xaos@darksmile.net
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>
>

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17. [tacgps] Re: GPS Distribution amplifier

From: Doug Bade <doug@clecom.com>
Date: Thu, 24 Jan 2002 09:21:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58880-2002.01.24-08.51.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I currently use a 4 way DSS splitter from Radio shack and even use their
inline DSS amplifier for long cable runs when testing, and to overcome loss
of 4-way splitter. Currently in use with 2 HP 10 Mhz GPS disciplined
oscillators, My Oncore DGPS, and a Trimble Svee-Six, with great signal
strength, and lock. It does not seem to bother the stability or accuracy of
any of them. It was also a lot cheaper than $100.00... DO not use the cable
variety, but the DSS versions are rated to 2 GHZ. Doug

At 08:50 AM 1/24/02 -0500, you wrote:
>John,
>
>That sounds great. I feel much better since you have already tested the HP
>unit.
>I just didn't want to take a chance on damaging my TAC2 or my antenna.
>
>Your second suggestion on using DSS satellite TV components: I wonder if
>that splitter
>supports powered antennas or passive ones. Again I am worried about
>damaging something.
>
>73,
>George
>
>John Ackermann N8UR wrote:
>
>>--On Thursday, January 24, 2002 8:24 AM -0500 xaos <xaos@darksmile.net>
>>wrote:
>>
>>>Hello everyone,

>>>
>>>I need to split the GPS signal from the TAC2 so I can feed a second
>>>GPS receiver. Some GPS distribution amplifiers I found,
>>>were very expensive ($300-$400 range).
>>>
>>>I also found a unit on sale at Ebay for ~$150.00.
>>>This one is a HP 58535A. Does anybody have info on this unit?
>>
>>
>>I bought one of the HP-58535As off eBay for about $100 (lucky I
>>guess). It works fine. It has N connectors all around.
>>
>>You can also build a cheap but effective splitter/amplifier using DSS
>>satellite TV components from Radio Shack; there've been a couple of
>>messages on the list with a pointer to a web site with info on the bits
>>and pieces to use, but I can't find the ##$%#@@#@ URL right now.
>>
>>73,
>>John
>>
>>
>>----
>>John Ackermann   N8UR   jra@febo.com   http://www.febo.com
>>President, TAPR   n8ur@tapr.org   http://www.tapr.org

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18. [tacgps] Re: GPS Distribution amplifier

From: Doug Bade <doug@clecom.com>
Date: Thu, 24 Jan 2002 09:24:59 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58882-2002.01.24-08.55.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

OOPs, I forgot to mention, put DC blocks on all but one of the ports, as
you need to pass DC from one GPS to run the preamp in the antenna. That is
a standard CATV part on the hooks at R.S... according to the docs with the
splitter it is DC isolated port to port, but I have not trusted or tried
this yet, as I fried on Oncore a while back, backfeeding DC into antenna
port with no power on main VCC.. Have fun, Doug KB8GVQ

At 09:21 AM 1/24/02 -0500, you wrote:
>I currently use a 4 way DSS splitter from Radio shack and even use their
>inline DSS amplifier for long cable runs when testing, and to overcome
>loss of 4-way splitter. Currently in use with 2 HP 10 Mhz GPS disciplined
>oscillators, My Oncore DGPS, and a Trimble Svee-Six, with great signal
>strength, and lock. It does not seem to bother the stability or accuracy
>of any of them. It was also a lot cheaper than $100.00... DO not use the
>cable variety, but the DSS versions are rated to 2 GHZ. Doug
>
>
>
>At 08:50 AM 1/24/02 -0500, you wrote:
>>John,
>>
>>That sounds great. I feel much better since you have already tested the
>>HP unit.
>>I just didn't want to take a chance on damaging my TAC2 or my antenna.
>>
>>Your second suggestion on using DSS satellite TV components: I wonder if
>>that splitter
>>supports powered antennas or passive ones. Again I am worried about
>>damaging something.
>>
>>73,
>>George
>>
>>John Ackermann N8UR wrote:
>>
>>>--On Thursday, January 24, 2002 8:24 AM -0500 xaos <xaos@darksmile.net>
>>>wrote:
>>>
>>>>Hello everyone,
>>>>

>>>>I need to split the GPS signal from the TAC2 so I can feed a second
>>>>GPS receiver. Some GPS distribution amplifiers I found,
>>>>were very expensive ($300-$400 range).
>>>>
>>>>I also found a unit on sale at Ebay for ~$150.00.
>>>>This one is a HP 58535A. Does anybody have info on this unit?
>>>
>>>
>>>I bought one of the HP-58535As off eBay for about $100 (lucky I
>>>guess). It works fine. It has N connectors all around.
>>>
>>>You can also build a cheap but effective splitter/amplifier using DSS
>>>satellite TV components from Radio Shack; there've been a couple of
>>>messages on the list with a pointer to a web site with info on the bits
>>>and pieces to use, but I can't find the ##$%#@@#@ URL right now.
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>>>73,
>>>John
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>>>----
>>>John Ackermann   N8UR   jra@febo.com   http://www.febo.com
>>>President, TAPR   n8ur@tapr.org   http://www.tapr.org
>
>
>---
>You are currently subscribed to tacgps as: DOUG@CLECOM.COM
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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19. [tacgps] Re: GPS Distribution amplifier

From: xaos <xaos@darksmile.net>
Date: Thu, 24 Jan 2002 10:18:44 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58897-2002.01.24-09.49.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Doug,

You mentioned the magic word "fried". That's what I am worried about.

-GH

Doug Bade wrote:

> OOPs, I forgot to mention, put DC blocks on all but one of the ports,
> as you need to pass DC from one GPS to run the preamp in the antenna.
> That is a standard CATV part on the hooks at R.S... according to the
> docs with the splitter it is DC isolated port to port, but I have not
> trusted or tried this yet, as I fried on Oncore a while back,
> backfeeding DC into antenna port with no power on main VCC.. Have fun,
> Doug KB8GVQ
>
>
>
> At 09:21 AM 1/24/02 -0500, you wrote:
>
>> I currently use a 4 way DSS splitter from Radio shack and even use
>> their inline DSS amplifier for long cable runs when testing, and to
>> overcome loss of 4-way splitter. Currently in use with 2 HP 10 Mhz
>> GPS disciplined oscillators, My Oncore DGPS, and a Trimble Svee-Six,
>> with great signal strength, and lock. It does not seem to bother the
>> stability or accuracy of any of them. It was also a lot cheaper than
>> $100.00... DO not use the cable variety, but the DSS versions are
>> rated to 2 GHZ. Doug
>>
>>
>>
>> At 08:50 AM 1/24/02 -0500, you wrote:
>>
>>> John,
>>>
>>> That sounds great. I feel much better since you have already tested
>>> the HP unit.

>>> I just didn't want to take a chance on damaging my TAC2 or my antenna.
>>>
>>> Your second suggestion on using DSS satellite TV components: I
>>> wonder if that splitter
>>> supports powered antennas or passive ones. Again I am worried about
>>> damaging something.
>>>
>>> 73,
>>> George
>>>
>>> John Ackermann N8UR wrote:
>>>
>>>> --On Thursday, January 24, 2002 8:24 AM -0500 xaos
>>>> <xaos@darksmile.net> wrote:
>>>>
>>>>> Hello everyone,
>>>>>
>>>>> I need to split the GPS signal from the TAC2 so I can feed a second
>>>>> GPS receiver. Some GPS distribution amplifiers I found,
>>>>> were very expensive ($300-$400 range).
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>>>>> I also found a unit on sale at Ebay for ~$150.00.
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>>>> I bought one of the HP-58535As off eBay for about $100 (lucky I
>>>> guess). It works fine. It has N connectors all around.
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>>>> You can also build a cheap but effective splitter/amplifier using
>>>> DSS satellite TV components from Radio Shack; there've been a
>>>> couple of messages on the list with a pointer to a web site with
>>>> info on the bits and pieces to use, but I can't find the ##$%#@@#@
>>>> URL right now.
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>>>> 73,
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>>>> John Ackermann   N8UR   jra@febo.com   http://www.febo.com
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>>>
>>
>>
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20. [tacgps] Re: GPS Distribution amplifier

From: Doug Bade <doug@clecom.com>
Date: Thu, 24 Jan 2002 10:33:14 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58902-2002.01.24-10.03.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

That happened long before the radio shack DSS splitter and dc blocks, I had directly coupled 2 gps's in a 2.4ghz 2 way splitter (not DC blocked) which I got at the Dayton Hamfest a couple years ago.. The DSS splitter with DC blocks works perfect. I have over 50 feet of feedline to the antenna, and no major issues.. I became a believer real quick. Just hooking up and watching TAC32 and or SA Watch before, during and after ..... With the DSS inline amp in just ahead of the 4 way splitter, it overcomes the splitter losses just fine. The 5 volts from the source GPS feeds the amp enough to make it work for 5-10 db or so... I have no

reservations... Doug

At 10:18 AM 1/24/02 -0500, you wrote:
>Doug,
>
>You mentioned the magic word "fried". That's what I am worried about.
>
>-GH
>
>
>Doug Bade wrote:
>
>>OOPs, I forgot to mention, put DC blocks on all but one of the ports, as
>>you need to pass DC from one GPS to run the preamp in the antenna. That
>>is a standard CATV part on the hooks at R.S... according to the docs with
>>the splitter it is DC isolated port to port, but I have not trusted or
>>tried this yet, as I fried on Oncore a while back, backfeeding DC into
>>antenna port with no power on main VCC.. Have fun, Doug KB8GVQ
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>>
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>>At 09:21 AM 1/24/02 -0500, you wrote:
>>
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>>>inline DSS amplifier for long cable runs when testing, and to overcome
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>>>disciplined oscillators, My Oncore DGPS, and a Trimble Svee-Six, with
>>>great signal strength, and lock. It does not seem to bother the
>>>stability or accuracy of any of them. It was also a lot cheaper than
>>>$100.00... DO not use the cable variety, but the DSS versions are rated
>>>to 2 GHZ. Doug
>>>
>>>
>>>
>>>At 08:50 AM 1/24/02 -0500, you wrote:
>>>
>>>>John,
>>>>
>>>>That sounds great. I feel much better since you have already tested the
>>>>HP unit.
>>>>I just didn't want to take a chance on damaging my TAC2 or my antenna.
>>>>
>>>>Your second suggestion on using DSS satellite TV components: I wonder
>>>>if that splitter
>>>>supports powered antennas or passive ones. Again I am worried about
>>>>damaging something.
>>>>
>>>>73,
>>>>George
>>>>
>>>>John Ackermann N8UR wrote:
>>>>
>>>>>--On Thursday, January 24, 2002 8:24 AM -0500 xaos
>>>>><xaos@darksmile.net> wrote:
>>>>>
>>>>>>Hello everyone,
>>>>>>
>>>>>>I need to split the GPS signal from the TAC2 so I can feed a second
>>>>>>GPS receiver. Some GPS distribution amplifiers I found,
>>>>>>were very expensive ($300-$400 range).
>>>>>>
>>>>>>I also found a unit on sale at Ebay for ~$150.00.
>>>>>>This one is a HP 58535A. Does anybody have info on this unit?
>>>>>
>>>>>
>>>>>
>>>>>I bought one of the HP-58535As off eBay for about $100 (lucky I
>>>>>guess). It works fine. It has N connectors all around.
>>>>>
>>>>>You can also build a cheap but effective splitter/amplifier using DSS
>>>>>satellite TV components from Radio Shack; there've been a couple of
>>>>>messages on the list with a pointer to a web site with info on the
>>>>>bits and pieces to use, but I can't find the ##$%#@@#@ URL right now.
>>>>>
>>>>>73,
>>>>>John
>>>>>
>>>>>

>>>>>----
>>>>>John Ackermann   N8UR   jra@febo.com   http://www.febo.com
>>>>>President, TAPR   n8ur@tapr.org   http://www.tapr.org
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>>>---
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>>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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21. [tacgps] Re: GPS Distribution amplifier

From: clemens@dwf.com
Date: Thu, 24 Jan 2002 10:28:50 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58920-2002.01.24-11.59.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

You dont mention what the second GPS receiver is, but if it can power
the antenna, then all you need to do is put in a splitter and remove the
shorting clip on the TAC2 that causes it to supply power to the antenna.
Thats how I run a TAC2 (with an Oncore VP) and a M12 here.
--
                                        Reg.Clemens
                                        reg@dwf.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] Re: GPS Distribution amplifier

From: xaos <xaos@darksmile.net>
Date: Thu, 24 Jan 2002 14:02:35 -0500 (EST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58937-2002.01.24-13.33.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

As a matter of fact, the second GPS receiver
is a custom Motorola box I got from eBay. The receiver ID
looks like a VP (6 channel 1994 date).
So, my target configuration would be a TAC2 (UT+)
and the Motorola box connected to the Motorola 97 antenna.
I checked the voltage on the Custom Motorola box and it
provides +5V.

I was not aware that the TAC2 could be configured to disable the
+5V from the antenna. The antenna connection is direct
from the UT+. I don't see how I could disable that.

-GH
>
> You dont mention what the second GPS receiver is, but if it can power
> the antenna, then all you need to do is put in a splitter and remove the
> shorting clip on the TAC2 that causes it to supply power to the antenna.
> Thats how I run a TAC2 (with an Oncore VP) and a M12 here.
> --
>   Reg.Clemens
>   reg@dwf.com
>
>
>

> ---
> You are currently subscribed to tacgps as: xaos@darksmile.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] Re: GPS Distribution amplifier

From: Jim Watt <jimwatt@pobox.com>
Date: Thu, 24 Jan 2002 19:56:53 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58943-2002.01.24-13.43.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi, I'm new to this GPS stuff, however have been involved
in TVRO for some time.

Global make a rather nice and cheap four way active splitter
which can accept power on any of its inputs, but protects
the inputs from each other.

http://www.globalcom.co.uk

European Satellite LNB's usually work on 12/14v so the drive
from the GPS board may be a bit low otherwise this item would
work nicely and provide adequate protection. It uses F
connectors - I'm still trying to come to terms with the fiddly
little things used on GPS.

Jim Watt ZB0D
http://www.gibnet.com

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24. [tacgps] Re: GPS Distribution amplifier

From: Dave Martindale <davem@cs.ubc.ca>
Date: Thu, 24 Jan 2002 12:29:11 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-58956-2002.01.24-14.59.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

>I was not aware that the TAC2 could be configured to disable the
>+5V from the antenna. The antenna connection is direct
>from the UT+. I don't see how I could disable that.

There are different ways to build a TAC2. Some options use a GPS receiver
board that internally provides 5 V to the antenna terminals, while others
use a 5 V supply provided by the TAC board. If your GPS board provides 5 V,
then you need a DC-isolated feed from the splitter. If your 5V power comes
from the TAC board, not the GPS receiver, then you can disable it with a
jumper.

        Dave

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25. [tacgps] Unknown Motorola unit.

From: xaos <xaos@darksmile.net>
Date: Sun, 27 Jan 2002 14:37:46 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-59476-2002.01.27-14.08.10--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello everyone,

Two weeks ago, I got this unit from Ebay and I've been trying
to get some info on it.

First, it is a Motorola 19' rack unit (2U). The front panel says: "Time

Frequency Reference"
There are no other markings anywhere on the unit.
The back had some labels: GPS Antenna", "-48V", "Redundancy Control",
"remote GPS", "RS232",
"1PPS out", and "5Mhz. Out".

I opened the unit and inside there was a GPS receiver what looked like
a crystal oven and some other stuff.

Well, I powered the unit using a Lambda Power supply, and connected it
to my computer using the TAC32 software.

It turns out that the unit has a Motorola VP receiver (V5.1). I connected it
to my GPS antenna and it started working fine and producing the 5Mhz.
signal as indicated.

There are some DIP switches inside but I need some info about their
function.
Specifically, there is a DIP switch block that is labeled:

1. 1/3 PPS - Ok this is an easy one.
2. No GPSR - No clue here.
3. Force ON - ??
4. Force Off - ??

The other problem is, that the unit seems to have the 1PPS signal on the
CTS pin not the DCD pin. I am out of luck on the Linux NTP driver here
because according to the code, the 1PPS signal must come from the DCD pin.

Well, I hope someone here has some info.

73,
-George Hrysanthopoulos, N2FGX

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Re: Unknown Motorola unit.

From: GS <gsanders1@bigfoot.com>
Date: Sun, 27 Jan 2002 15:45:01 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-59500-2002.01.27-15.15.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

xaos wrote:
>
> The other problem is, that the unit seems to have the 1PPS signal on the
> CTS pin not the DCD pin. I am out of luck on the Linux NTP driver here
> because according to the code, the 1PPS signal must come from the DCD pin.

Shouldn't be a real problem....

Two ways to fix it. Since the NTP driver is open source, just
recode it to move the signal to CTS

Or, if you're like me, and more comfortable with a pound of
solder than a compiler, just make up a simple custom RS-232
cable, moving the 1PPS signal wherever you need it.
--

Gary Sanders

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] RE: Unknown Motorola unit.

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Sun, 27 Jan 2002 21:37:36 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-59543-2002.01.27-21.08.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The VP 5.1 is most likely one of the original 6-channel rcvrs. 5.1 was the
first production release of the firmware that worked pretty nearly

correctly.

48v power sez that it came out of a telephone facility, or perhaps an early
analog cell-fone site.

It would appear this is a GPS disciplined xtal with holdover. Not knowing
what xtal unit it is, but being pretty well versed in the old Motorola
receiver, my gut feeling is that (now that S/A is off) this unit will work
as a frequency standard at the ~1e-9 level. Maybe 1e-10 if you are lucky.

The switches and connectors are a mystery to me too.

73 de Tom, W3IWI

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February 2002

Original source file: tacgps.0202
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0202

1. [tacgps] Motorola GT Plus Oncore suitable for accurate timing?

From: "John K. Pringle" <jpringle@tampabay.rr.com>
Date: Sun, 3 Feb 2002 09:43:06 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60795-2002.02.03-09.13.46--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have been using a Garmin GPS-20 GPS receiver on a TAC-2 board with Brooks Shera's GPS controller and a FTS-1000 quartz oscillator as the basis for a pretty good frequency/time standard. About a week ago I lost all output from the Garmin (both 1 PPS and NEMA). At this point I'm not sure whether it is the receiver or the antenna (Garmin 45XL active antenna) that has failed and I don't have a spare antenna to try. Assuming that it is the Garmin that has failed, then I would like to find one of the older Motorola Oncore VP receivers to replace it. I know this unit is good for accurate timing and is a good fit for the TAC-2 board. Question #1: Assuming that I can't locate one of the older Oncore VPs, what is the modern equivalent? Does anyone have a spare one they would be willing to part with for a reasonable price? Question #2: There are some Motorola GT Plus Oncore receivers available on eBay. These units are described as being made for the automotive market and can be used for "medium accuracy timing applications". They do fit the TAC-2 board. Is anyone familiar with these units and would they be a good choice for my application. Any advice would be greatly appreciated.

Thanks, John W4SF

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Re: Motorola GT Plus Oncore suitable for accurate timing?

From: Mark Miller <markm@kramrellim.com>
Date: Sun, 03 Feb 2002 10:41:50 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60808-2002.02.03-11.13.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a Oncore VP that I would be willing to sell or trade. What exactly do you mean by an older VP?

Mark Miller
N5RFX

At 09:43 AM 2/3/02 -0500, you wrote:
>I have been using a Garmin GPS-20 GPS receiver on a TAC-2 board with Brooks
>Shera's GPS controller and a FTS-1000 quartz oscillator as the basis for a
>pretty good frequency/time standard. About a week ago I lost all output from
>the Garmin (both 1 PPS and NEMA). At this point I'm not sure whether it is
>the receiver or the antenna (Garmin 45XL active antenna) that has failed and
>I don't have a spare antenna to try. Assuming that it is the Garmin that has
>failed, then I would like to find one of the older Motorola Oncore VP
>receivers to replace it. I know this unit is good for accurate timing and is
>a good fit for the TAC-2 board. Question #1: Assuming that I can't locate
>one of the older Oncore VPs, what is the modern equivalent? Does anyone have
>a spare one they would be willing to part with for a reasonable price?
>Question #2: There are some Motorola GT Plus Oncore receivers available on
>eBay. These units are described as being made for the automotive market and
>can be used for "medium accuracy timing applications". They do fit the TAC-2
>board. Is anyone familiar with these units and would they be a good choice
>for my application. Any advice would be greatly appreciated.
>
>Thanks, John W4SF
>
>
>
>
>
>---
>You are currently subscribed to tacgps as: markm@kramrellim.com

>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: Motorola GT Plus Oncore suitable for accurate timing?

From: kirbybq@hiwaay.net
Date: Sun, 03 Feb 2002 17:22:14 -0600 (CST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60876-2002.02.03-17.53.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Synergy use to have refurburnished units. You may drop them an e-mail and see
what models they still have. I bought 2 about a year ago, of the VP with ver
10 software. I have not had any problems with them. I beleive they were
around $250 or so, I cannot remember.

Quoting Rejnold Byzio <rejnold.byzio@epost.de>:

> Hi all,
>
> > Question #1: Assuming that I can't locate
> > one of the older Oncore VPs, what is the modern equivalent? Does
> > anyone have a spare one they would be willing to part with for a
> > reasonable price?
>
> "Whoever has come too late is punished by life" as they say
> here in Germany. Since i am subscribed to this list, i wanted
> to ask if someone would sell an used Oncore VP to me, but
> the costs for money transfer are half a fortune here, and you
> don't get new VP's anymore (discontinued 1999).
> I've never seen them on ebay, too.
>
> btw: The Oncore UT+ is the replacement for timing applications.
> (without raw satellite data, alas).
>
> > #2: There are some Motorola GT Plus Oncore receivers available on
> > eBay. These units are described as being made for the automotive
> > market and can be used for "medium accuracy timing applications".
> > They do fit the TAC-2 board. Is anyone familiar with these units
> > and would they be a good choice for my application.
>
> The accuracy of the 1pps signal is in the 500ns range with
> the GT+ and under 50 ns with the UT+. See
> http://www.motorola.com/ies/GPS/pdfs/models.pdf
>
> Rejnold
>
> ---
> You are currently subscribed to tacgps as: kirbybq@hiwaay.net
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Re: Motorola GT Plus Oncore suitable for accurate timing?

From: Rejnold Byzio <rejnold.byzio@epost.de>
Date: Sun, 3 Feb 2002 20:12:15 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-60827-2002.02.03-14.07.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi all,

> Question #1: Assuming that I can't locate
> one of the older Oncore VPs, what is the modern equivalent? Does
> anyone have a spare one they would be willing to part with for a
> reasonable price?

"Whoever has come too late is punished by life" as they say
here in Germany. Since i am subscribed to this list, i wanted
to ask if someone would sell an used Oncore VP to me, but
the costs for money transfer are half a fortune here, and you

don't get new VP's anymore (discontinued 1999).
I've never seen them on ebay, too.

btw: The Oncore UT+ is the replacement for timing applications.
(without raw satellite data, alas).

> #2: There are some Motorola GT Plus Oncore receivers available on
> eBay. These units are described as being made for the automotive
> market and can be used for "medium accuracy timing applications".
> They do fit the TAC-2 board. Is anyone familiar with these units
> and would they be a good choice for my application.

The accuracy of the 1pps signal is in the 500ns range with
the GT+ and under 50 ns with the UT+. See
http://www.motorola.com/ies/GPS/pdfs/models.pdf

Rejnold

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5. [tacgps] FW: VP Oncore Availability

From: "Steven Bible" <n7hpr@tapr.org>
Date: Mon, 11 Feb 2002 20:01:01 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-62482-2002.02.11-21.27.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Everyone, I am passing on this message from Art at Synergy Systems.

Please tell Art thank you and that you heard it from TAPR. Art has been an
ardent supporter of TAPR.

I'll update the TAPR web site accordingly.

- Steve, N7HPR
  (n7hpr@tapr.org)

-----Original Message-----
From: info@synergy-gps.com [mailto:info@synergy-gps.com]
Sent: Friday, February 08, 2002 10:10 AM
To: Steve Bible
Subject: VP Oncore Availability

Steve,

In the VP DGPS Kit area of the TAPR.ORG web site at
(http://www.tapr.org/tapr/html/kitsf.html) it says: "While new units
are no longer available, surplus and refurbished units can be found."
We have more than 100 new VP Oncore P/N B4121P111x parts that are
perfect for use with the TAPR DGPS Kit and TAC Timing projects and
we'll have many more within the next couple of weeks. The VP/B4
price has been lowered to $149. If the carrier phase option is
desired, we can re-flash and test the parts here for $35 additional
for a total of $184 each. A 10% educational discount applies which
would make the final cost $134.10 and $165.60 respectively.
We're about to change the home page of our web site to list "Excess
Inventory items" and a listing of both new and refurbished VP Oncore
parts will be included. Anyway, the info on the TAPR site should
probably be modified to say that both new and refurbished VP Oncore
parts are still available "while the supply lasts."
Thanks & Regards,
Art Sepin

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] Re: FW: VP Oncore Availability

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 12 Feb 2002 07:10:13 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-62517-2002.02.12-07.38.42--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Woohoo! Good news!

Thanks, gerry
--
Steven Bible wrote:
>
> Everyone, I am passing on this message from Art at Synergy Systems.
>
> Please tell Art thank you and that you heard it from TAPR. Art has been an
> ardent supporter of TAPR.
>
> I'll update the TAPR web site accordingly.
>
> - Steve, N7HPR
>   (n7hpr@tapr.org)
>
> -----Original Message-----
> From: info@synergy-gps.com [mailto:info@synergy-gps.com]
> Sent: Friday, February 08, 2002 10:10 AM
> To: Steve Bible
> Subject: VP Oncore Availability
>
> Steve,
>
> In the VP DGPS Kit area of the TAPR.ORG web site at
> (http://www.tapr.org/tapr/html/kitsf.html) it says: "While new units
> are no longer available, surplus and refurbished units can be found."
> We have more than 100 new VP Oncore P/N B4121P111x parts that are
> perfect for use with the TAPR DGPS Kit and TAC Timing projects and
> we'll have many more within the next couple of weeks. The VP/B4
> price has been lowered to $149. If the carrier phase option is
> desired, we can re-flash and test the parts here for $35 additional
> for a total of $184 each. A 10% educational discount applies which
> would make the final cost $134.10 and $165.60 respectively.
> We're about to change the home page of our web site to list "Excess
> Inventory items" and a listing of both new and refurbished VP Oncore
> parts will be included. Anyway, the info on the TAPR site should
> probably be modified to say that both new and refurbished VP Oncore
> parts are still available "while the supply lasts."
> Thanks & Regards,
> Art Sepin
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] RE: VP Oncore Availability

From: "Rob Wittner" <rmw@rwa-inc.com>
Date: Tue, 12 Feb 2002 14:29:57 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-62598-2002.02.12-14.00.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Excuse the ignorance... what is the carrier-phase option? (I have an idea
of what it is, but would like a definitive answer from a knowledgeable
source.) Why would I want it? What would I give up by having it?

Thanks,

   -Rob

> -----Original Message-----
> If the carrier phase option is
> desired, we can re-flash and test
> the parts here for $35 additional
> for a total of $184 each.

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8. [tacgps] RE: VP Oncore with carrier phase

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Tue, 12 Feb 2002 16:03:25 -0800 (PST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-62641-2002.02.12-18.41.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gentlemen,

   I understand that carrier phase can be utilized to significantly increase the
accuracy of received timing signals but I need to know whether the TAPR h/w &
s/w is capable of utilizing it or what might be required to harnass this output?

73,

Jeffrey Pawlan, WA6KBL

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9. [tacgps] RE: VP Oncore Availability

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Tue, 12 Feb 2002 22:04:06 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-62709-2002.02.12-22.32.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rob Wittner wrote:
>
> Excuse the ignorance... what is the carrier-phase option? (I have an idea
> of what it is, but would like a definitive answer from a knowledgeable
> source.) Why would I want it? What would I give up by having it?

Carrier phase adds to the observables a level of granuilarity in the
measurement of the pseudorange. We can measure carrier phase to about
0.1-lamda, or about 0.17 cm, on most reasonable receivers. An issue
arises with correcting for integer ambiguity: We know what the fraction
of phase of the received signal is, but not the integer number of
carrier waves to use. There are mathematical diversions that allow
convergence here...

Using code-phase methods, you can reasonably expect about 6m accuracy
for autonomous position determinations; with carrier-phase data, and
post processing, one can expect, oh, say, 1-2 cm accuracies with
comparison to a known, fixed receiver, 3-5 cm using kinematic
techniques, or about 8-10 cm using autonomous, but alas, still
post-processed fixes.

I'm a bit fuzzy and ready for bed, so, if this doesn't answer the
question, please feel free to harass me and ask for clarification.

73, gerry n5jxs
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Carrier Phase

From: kirbybq@hiwaay.net
Date: Wed, 13 Feb 2002 02:29:53 -0600 (CST)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-62757-2002.02.13-03.01.22--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Carrier Phase is mainly used for surveying applications. For Static surveying,
you place one receiver on a known benchmark and place another receiver at the
unknown. You typically record about 45 to 60 mins of carrier phase
observations for a shot under 10 KM. The results are typically 1 to 2 cm
positioning with the Oncore VP. If you have two units, you can do this with
software (not cheap). If you want to try this, I have software and can post
process it for you.

NIST also has a method of using carrier phase for precision timing, I beleive
they call it common view for observing the same satellite to determine timing
delays between standard time and your location.

I am not sure, I beleive you also need this option if you plan to run a DGPS
system using the Oncore as the base/reference station.

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11. [tacgps] New PSR available on-line

From: "John R. Ackermann" <jra@febo.com>
Date: Sat, 16 Feb 2002 10:10:17 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63418-2002.02.16-09.44.40--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The Winter, 2002 issue of TAPR's journal, The Packet Status Register, is
now available on-line at http://www.tapr.org/tapr/html/Fpsr.html . Hope
you enjoy it!

73,
John N8UR

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

12. [tacgps] TAC32 2.6.0

From: "G. Beat" <gregory.beat@attbi.com>
Date: Sat, 16 Feb 2002 09:59:46 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63450-2002.02.16-10.31.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Well I successfully updated to TAC32 2.6.0 ... and notice that the password may have changed.

I would imaging that the password went into the @Home bit bucket (also known as the black hole).

Greg
w9gb

w9gb@arrl.net OR
gregory.beat@attbi.com

13. [tacgps] RE: TAC32 2.6.0

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Sat, 16 Feb 2002 14:22:55 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63486-2002.02.16-13.54.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Greg -- the new version does have a new password. There is also a new
version of TAC32Plus plus a new product, TAC32Multi which can be seen at
http://www.cnssys.com/Tac32Plus/ and http://www.cnssys.com/Tac32Multi/. The
Plus and Multi versions support logging of time interval data from
HP53131/132 counters and can serve as a Windoze NTP Time Server host.

If you have a copy of the basic TAC32 obtained from TAPR, then call the TAPR
office for support.

If you purchased a commercial copy of any of the versions from Rick@CNS,
then he would have sent you a personal Email last week; if it was lost, then
then contact him at mailto:rick@cnssys.com

73, Tom
  -----Original Message-----

From: bounce-tacgps-25677@lists.tapr.org
[mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of G. Beat
Sent: Sat, February 16, 2002 11:00
To: TAPR Special Interest Group
Subject: [tacgps] TAC32 2.6.0

Well I successfully updated to TAC32 2.6.0 ... and notice that the password may have changed.

I would imaging that the password went into the @Home bit bucket (also known as the black hole).

Greg
w9gb

w9gb@arrl.net OR
gregory.beat@attbi.com

14. [tacgps] RE: TAC32 2.6.0

From: "Steven Bible" <n7hpr@tapr.org>
Date: Sat, 16 Feb 2002 19:34:56 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63545-2002.02.16-21.03.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Greg,

I've changed your email to gregory.beat@attbi.com on the TAC32 list. I'll be sending you the updated password in a private email to follow.

If anyone else missed the announcement on the TAC32 list for version 2.6.0, and you registered TAC32 from TAPR, please email me off list. I'll email you the new password.

Administration of your account on the TAC32 list is easy. Simply go to

    http://www.tapr.org/cgi-bin/lyris.pl?enter=tac32&text_mode=0

for other TAPR lists you may be subscribe to, you can administer them from the Lyris page at

    http://www.tapr.org/cgi-bin/lyris.pl?site=tapr

There is a link to this page from the TAPR home page.

- Steve, N7HPR
(n7hpr@tapr.org)

-----Original Message-----
From: bounce-tacgps-5687@lists.tapr.org
[mailto:bounce-tacgps-5687@lists.tapr.org]On Behalf Of G. Beat
Sent: Saturday, February 16, 2002 9:00 AM
To: TAPR Special Interest Group
Subject: [tacgps] TAC32 2.6.0

Well I successfully updated to TAC32 2.6.0 ... and notice that the password may have changed.

I would imaging that the password went into the @Home bit bucket (also known as the black hole).

Greg
w9gb

w9gb@arrl.net OR
gregory.beat@attbi.com

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] AO-40 and KA3HDO in the news in GPS WORLD

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Sun, 17 Feb 2002 00:40:50 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: "AMSAT BoD \(E-mail\)" <bod@amsat.org>,
"AMSAT Officers \(E-mail\)" <officers@amsat.org>
Message-ID: <LYR6754-63601-2002.02.17-00.12.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For those of you interested in the use of GPS onboard our spacecraft, I call attention to an article in the latest (Feb.2002) issue of GPS World. Pages 22-31 have an article entitled "Formation Flying in Space". There are 5 authors from NASA Goddard group headed by Frank Bauer, KA3HDO (including Frank!) and one from the Stanford (Jonathan How is a Professor in the same department as Bob Twiggs and his small satellite projects).

Figure 1 of the article shows some AO-40 GPS results from the Trimble TANS Vector receivers that NASA/GSFC provided. [The data shown was laboriously downloaded thru RUDAK by WD0E and KB0G, by the way].

[In addition to the P3D/AO40 Trimble receivers, the article also mentions GSFC's in-house PiVoT receiver which had its genesis in the receiver that Frank and I tried to develop for P3D back in 1994/5. When it became clear that our "home-brew" efforts wouldn't converge in time for launch, Frank arranged for the NASA experiment using NASA-supplied hardware.]

For anyone interested in some of the applications of GPS on spacecraft, I urge you to read this article!

73 de Tom, W3IWI

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] Re: AO-40 and KA3HDO in the news in GPS WORLD

From: xaos <xaos@darksmile.net>
Date: Sun, 17 Feb 2002 04:25:17 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63626-2002.02.17-03.56.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Where is the URL dude??
I can't read paper anymore :)
-N2FGX

Tom Clark (W3IWI) wrote:

>For those of you interested in the use of GPS onboard our spacecraft, I call
>attention to an article in the latest (Feb.2002) issue of GPS World. Pages
>22-31 have an article entitled "Formation Flying in Space". There are 5
>authors from NASA Goddard group headed by Frank Bauer, KA3HDO (including
>Frank!) and one from the Stanford (Jonathan How is a Professor in the same
>department as Bob Twiggs and his small satellite projects).
>
>Figure 1 of the article shows some AO-40 GPS results from the Trimble TANS
>Vector receivers that NASA/GSFC provided. [The data shown was laboriously
>downloaded thru RUDAK by WD0E and KB0G, by the way].
>
>[In addition to the P3D/AO40 Trimble receivers, the article also mentions
>GSFC's in-house PiVoT receiver which had its genesis in the receiver that
>Frank and I tried to develop for P3D back in 1994/5. When it became clear
>that our "home-brew" efforts wouldn't converge in time for launch, Frank
>arranged for the NASA experiment using NASA-supplied hardware.]
>
>For anyone interested in some of the applications of GPS on spacecraft, I
>urge you to read this article!
>
>73 de Tom, W3IWI
>
>
>
>---
>You are currently subscribed to tacgps as: xaos@darksmile.net
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

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17. [tacgps] Re: AO-40 and KA3HDO in the news in GPS WORLD

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Sun, 17 Feb 2002 09:17:12 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-63679-2002.02.17-08.48.58--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> -----Original Message-----
> From: bounce-tacgps-25677@lists.tapr.org
> [mailto:bounce-tacgps-25677@lists.tapr.org]On Behalf Of xaos
> Sent: Sun, February 17, 2002 04:25
> To: TAPR Special Interest Group
> Subject: [tacgps] Re: AO-40 and KA3HDO in the news in GPS WORLD
>
>
> Where is the URL dude??
> I can't read paper anymore :)
> -N2FGX

Frightfully sorry, old chap. GPS World is published on demolished forest
products. Not surprisingly (and as revealed by the great oracle Google)
their corporate address is www.GPSWorld.com. Their online material tends to
lag reality by 1-2 months.

Tom

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18. [tacgps] GPS, TAC2 and Timing Related Web Site

From: xaos <xaos@darksmile.net>
Date: Wed, 20 Feb 2002 00:30:28 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: gkon@speakeasy.net, rbarulich@earthlink.net, vasili@kekrops.com
Message-ID: <LYR6754-64414-2002.02.20-00.02.30--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello everyone,

I just put the finishing touches to my web site: http://www.darksmile.net

This is a site for anyone interested in High Accuracy Timing, GPS and TAC2.

Some topics:
  Detailed information on building the TAC2 (including pictures).
  Detailed instruction on NTP compilation and configuration.
  New software that allows you to share your GPS data with others.
  ...and much much more.

I would like to personally thank the following people:

Mr. Brooks Shera. It was his article on QST that got me started.
Mr. John Ackermann who provided invaluable information on the TAC2.
The members of this list for all their help.

Enjoy the site and feel free to email me with your comments,

73,
George Hrysanthopoulos, N2FGX

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19. [tacgps] MJD 52325.83495

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Wed, 20 Feb 2002 14:42:24 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64498-2002.02.21-02.36.49--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Most people are calling it 2002 20/02 20:02 but around here it looked like
this.
/tvb
http://www.leapsecond.com/pages/mjd52325/
[Attachment: mjd52325.jpg; image/jpeg; 18,008 bytes]

20. [tacgps] RE: MJD 52325.83495

From: jim_johnson@agilent.com
Date: Thu, 21 Feb 2002 08:57:58 -0800
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-64640-2002.02.21-11.32.29--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hi Tom,

    After thinking about this for a few seconds, it occurred to
me that the palindrome is not unique. The sequence 2112 works
just as well. So 21:12, 21/12, 2112 (9:12 PM, Dec. 21, 2112) has
the same properties as the 2002 sequence. Oh well.

73,
Jim W6SC

> -----Original Message-----
> From: Tom Van Baak [mailto:tvb@leapsecond.com]
> Sent: Wednesday, February 20, 2002 2:42 PM
> To: TAPR Special Interest Group
> Subject: [tacgps] MJD 52325.83495
>
>
> Most people are calling it 2002 20/02 20:02 but around here
> it looked like
> this.
> /tvb
> http://www.leapsecond.com/pages/mjd52325/
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

March 2002

Original source file: tacgps.0203
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0203

1. [tacgps] GPS receiver help

From: Glenn Little <glittle@awod.com>
Date: Fri, 08 Mar 2002 01:29:42 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67331-2002.03.08-01.04.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a WM101 GPS receiver. This is a survey receiver. It was made by
Magnavox / Wild Heerbrung. I think that this was bought out by Leica. The
receiver is complete with carring case and tripod mounted survey
antenna. My problem is that it will not get a fix. I have not been able
to get anything out of the above three companies about this receiver. I
suspect it has a Y2K or week 1024 rollover issue. My question is, does
anyone know anything about this unit? I bought it at a hamfest. I would
like to get the receiver going as it passes all diagnostics, has
datalogging capabilities, and appears to be very accurate as it takes into
account atmospheric pressure. I have the operators manual for this
receiver. I cannot get it to acquire an almanac. Any help/ideas? I guess
I could trash the receiver and use the antenna with an Oncore receiver.

73
Glenn
WB4UIV

Glenn Little   glittle@awod.com   QCWA LM 28417
Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] Sv: GPS receiver help

From: "LH Mobilradio A/S" <lhmobil@post4.tele.dk>
Date: Fri, 8 Mar 2002 08:29:57 +0100
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67335-2002.03.08-02.00.56--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hello Glen
I have no experiance in said receiver, but there is a paint possibility that it does not deliver output
because is is set such that it requires a RTK/RTCM input before delivering output.

Kind regards

Kurt de OZ7OU from denmark (the capital city of sweeden I heard resently)

----- Original Message -----
From: Glenn Little <glittle@awod.com>
To: TAPR Special Interest Group <tacgps@lists.tapr.org>
Sent: Friday, March 08, 2002 7:29 AM
Subject: [tacgps] GPS receiver help

> I have a WM101 GPS receiver. This is a survey receiver. It was made by
> Magnavox / Wild Heerbrung. I think that this was bought out by Leica. The
> receiver is complete with carring case and tripod mounted survey
> antenna. My problem is that it will not get a fix. I have not been able
> to get anything out of the above three companies about this receiver. I
> suspect it has a Y2K or week 1024 rollover issue. My question is, does
> anyone know anything about this unit? I bought it at a hamfest. I would
> like to get the receiver going as it passes all diagnostics, has
> datalogging capabilities, and appears to be very accurate as it takes into
> account atmospheric pressure. I have the operators manual for this
> receiver. I cannot get it to acquire an almanac. Any help/ideas? I guess
> I could trash the receiver and use the antenna with an Oncore receiver.
>
> 73
> Glenn

> WB4UIV
>
> --
> Glenn Little   glittle@awod.com   QCWA LM 28417
> Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
> QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR
> --
>
>
>
> ---
> You are currently subscribed to tacgps as: LHMOBIL@POST4.TELE.DK
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

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3. [tacgps] Re: GPS receiver help

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Fri, 08 Mar 2002 08:28:44 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-67362-2002.03.08-09.01.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I can ask some folks... I'll pass it on. What vintage is this receiver?

gerry
--
Glenn Little wrote:
>
> I have a WM101 GPS receiver. This is a survey receiver. It was made by
> Magnavox / Wild Heerbrung. I think that this was bought out by Leica. The
> receiver is complete with carring case and tripod mounted survey
> antenna. My problem is that it will not get a fix. I have not been able
> to get anything out of the above three companies about this receiver. I
> suspect it has a Y2K or week 1024 rollover issue. My question is, does
> anyone know anything about this unit? I bought it at a hamfest. I would
> like to get the receiver going as it passes all diagnostics, has
> datalogging capabilities, and appears to be very accurate as it takes into
> account atmospheric pressure. I have the operators manual for this
> receiver. I cannot get it to acquire an almanac. Any help/ideas? I guess
> I could trash the receiver and use the antenna with an Oncore receiver.
>
> 73
> Glenn
> WB4UIV
>
> --
> Glenn Little   glittle@awod.com   QCWA LM 28417
> Amateur Callsign: WB4UIV   wb4uiv@amsat.org   AMSAT LM 2178
> QTH: Goose Creek, SC USA (EM92xx)   ARRL TAPR
> --
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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4. [tacgps] Rockwell Jupiter

From: "Brian Kirby" <kirbybq@hiwaay.net>
Date: Fri, 22 Mar 2002 17:50:6
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70260-2002.03.22-18.22.54--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

We□ll, I found a Rockwell Jupiter OEM GPS board, I bought about 2 years
ago. As I have a little time on my hands (got laid off), I decided to

interface it. The board is the model TU30-D145 software version 1.8.

The board appears to have some Y2K problems. If you bring it up in the Rockwell binary mode using LabMon, everything appears to work OK. If you bring it up in the NMEA mode, the time is late by two seconds.

The board has a 1 PPS output and its pulse is only 25 mS wide. It also has a 10 Khz output and it shows a short term jitter of around 500 nS. Longterm is fine on both signals. Both lock to GPS, after the receiver locks up to 4 satellites.

It has some weird features for position smoothing, position pinning, locking altitude etc. You can boot it in 4 modes; cold start from ROM in NMEA or Rockwell Binary, or boot it from SRAM or EEPROM, in NMEA or binary. The SRAM and EEPROM allows updates, and it will boot faster as it keeps the last satellite data in it. It does not lend itself to changing the modes by software, it has to be done with 2 switches. Then you have to reset the receiver.

I appears it will be OK for long term timing, in my case. All I do is watch the drift on a rubidium, and its holding with the Oncore VP (I have a steady 200 nS difference between the two). I read it once a day to determine the drift of the rubidium, which is around 1uS a day. I doubt it would be any good against a cesium or maser, because of the jitter.

I can□t complain, I got the board for under $25 at a ham fest. The worst part was finding the technical info on the board. Rockwell sold to Conextant, who sold to SiRF. I found a lot of the technical info on a German internet site.

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5. [tacgps] FS: TAC2, CSI DGPS board, Svee6, others

From: Jeff King <jeff@aerodata.net>
Date: Tue, 26 Mar 2002 17:52:43 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-70823-2002.03.26-17.23.12--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Cleaning the shack and I have some stuff I don't need anymore and thought I would offer it to the list.

TAPR TAC-2 This is the Tom Clark most accurate clock kit, which is professionally built but never used. For more info please see the TAPR TAC-2 site: http://www.tapr.org/tapr/html/tac2.html $75

CSI SBX-2 Differential receiver. This is a OEM board used to receive cost guard differential navigation signals and output RTCM-104 DGPS corrections to a GPS. Note this is just the OEM board, needs antenna and RS-232 adapter to use with most GPS's. http://www.navtechgps.com/supply/sbx2.asp $100

Trimble Svee-6 OEM GPS board (works but connector bent
 easily replaced)
http://www.google.com/search?q=cache:pT8nrY4wMesC:www.rodaxwireless.com/images
/jpg/trimbleCM3.pdf+TRIMBLE+CM3&hl=en $10

TAPR MIC-E This is a full up through the MIC APRS tracker. The original MIC-E fully assembled (less the front panel mechanics) by Paccomm. Never used. For more info see: http://www.tapr.org/tapr/html/Fmic-e.html $80

MIM/MIC-E module This is the tracker that started it all. Can be used as both a MIC-E module as well as a telemetry module allowing A/D and digital I/O to be transferred over APRS. These are also popular with amateur radio ballooners. For more info please see:
http://www.toad.net/~wclement/bruninga/mim2.html $50

R-100 Serpac cases (4 total) These are brand new never been used in the box cases that are great for trackers or other projects.
http://www.digikey.com/scripts/us/dksus.dll?Detail?Ref=67998&Row=226947
$10ea
R-200 (1) Serpac case
http://www.digikey.com/scripts/us/dksus.dll?Detail?Ref=68291&Row=226968
$12ea
For a example of a tracker built with a similar box see:
http://www.qsl.net/n6qab/aprs1.htm

20.9 meg Sandisk FlashDrive SOIB-20 this is a FlashBased laptop IDE drive

complete. Just hook it to your 44 pin laptop IDE cable and you are ready to
format it and move your OS on it. http://www.sandisk.com/oem/flashdrive.asp
$25

Basic stamp development kit including Scott Edwards counterfeit stamp
http://www.parallaxinc.com/html_files/products/BS_Kits/stamp1_starter_kit.asp
  (similar) $25

Motorola 68HC705 EVM plus training manual. $7

Payment by paypal only, shipping is extra and is via priority mail. $4 up to
2lbs total if I can get it all in one box.

--
Jeff King, jeff@aerodata.net on 03/26/2002

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April 2002

Original source file: tacgps.0204
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0204

1. [tacgps] 2002 Digital BASH at Dayton Hamvention

```
From: "John R. Ackermann" <jra@febo.com>
Date: Tue, 09 Apr 2002 18:17:11 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-73125-2002.04.09-17.57.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

```
Going to the Dayton Hamvention?  Then plan to attend the annual Digital*BASH
sponsored by TAPR and the Miami Valley FM Association to be held on Friday,
May 17, 2002!

For reservations, please contact the TAPR office as described below.

----
What?
        An event for the digitally-inclined ham, featuring:
        *  Buffet dinner (Prime Rib, Chicken, and Pasta)
        *  Keynote Address (Speaker to be named)
        *  TAPR special interest group meetings
        *  "Birds of a Feather" gatherings

When?
        Friday evening, May 17, 2002
        Doors open at 7:00 pm; dinner served at 7:30 pm
        Speaker and meetings after dinner


Where?
        Kohler's Banquet Center, 4548 Presidential Way, Kettering
        (39 40.75N, 84 08.43W), about 6 miles SE of downtown Dayton --
        just off of East David Road.  Detailed directions and maps are available
        on the TAPR web site (http://www.tapr.org/tapr/html/Fdayton.maps.html)
        or at the TAPR booth.


How?
        Dinner requires advance registration and payment through TAPR.
        Tickets will be available at the TAPR booth on Friday, though
        we strongly encourage registration <before> Hamvention.  The cost
        is $25.00 per person, tax and tip included.

        All amateurs are welcome to attend, enjoy the speaker, and
        particpate in the meetings, although only those purchasing a dinner
        can eat.

        To register, contact:
        PACK*BASH
        c/o TAPR
        8987-309 E. Tanque Verde Road #337
        Tucson, AZ   85749-9399

        Phone: 972-671-TAPR (8277)
        Fax: 972-671-8716
        Internet: tapr@tapr.org

        Visa/Mastercard Accepted

Who?
        PACK*BASH is co-sponsored by TAPR -- Tucson Amateur Packet Radio,
        the national leader in digital communication -- and the Miami
        Valley FM Association, Dayton's packet radio club.

For more information (including maps), go to
http://www.tapr.org/tapr/html/dayton.html#packetbash, or send email to
tapr@tapr.org.


---
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```

2. [tacgps] Rubidium Cooling

From: "Brian Kirby" <kirbybq@hiwaay.net>
Date: Fri, 19 Apr 2002 2:30:25
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75170-2002.04.19-03.04.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Since I got my dividers built a couple of months ago, I have been able to
monitor the drift on my rubidium, a FRK unit, against the Motorola Oncore
VP gps 1 pps signal. What I have noticed, is the rubidium is temp
sensitive, the warmer it runs, the faster I lose time. My rack was
averaging around 88 degrees and the rubidium was losing around a
microsecond a day. Thats a very expensive therometer.

I put a cooling fan in the rack and blocked the airflow in the rack, so it
sucks air from the bottom of the rack and exhuast it at the top. The rack
is in the basement and the temp goes around 55 degrees in the winter to 70
degrees in the summer. At the present, I have noticed the temp inside of
the rack is averaging about 70 to 72 degrees. And now the rubidium is
holding parts in the 12th.

I have pondered a idea of maybe using some of the water cooling heat
exchangers for computers to regulate the temp of the rubidium. I notice
that several units are avilable that have pumps that run off of 12 volts,
and thats lends itself to running off of the back up batteries.

Any pro's and con's are welcomed. 73s - KD4FMN - Brian

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: Rubidium Cooling

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Fri, 19 Apr 2002 17:43:10 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75288-2002.04.19-17.19.05--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian,

Is there a reason why you are not pursuing steering the Rb with the OnCore?

I just got back to my steering project after a long diversion (everything
from taxes on up). This last week I got the Rb steering using what I call
a dog-simple hardware scheme and it works fine. Not having a better
reference than gps, I can't really say what stability I'm achieving.

My guess is that getting the ultimate performance requires both temp
control to hold the short-term (such as the daily temp cycle) and gps for
the longer term. I've thought about schemes for controlling the temp,
however I checked the temp I found the air condx maintains the Rb in the 79
- 82 deg F range over the 24 hour cycle. Consequently, controlling the Rb
temp has been low on the "project list."

Rather than work with cooling, it would seem that placing the Rb in a metal
box, possibly with a fan to transfer heat from the Rb to the box, then
holding the box at a constant temp slightly above the highest ambient, such
as 72 deg F in your case, would be a way of maintaining constant temp at
the Rb. At our previous QTH the dewpoint in the summer exceeded the ground
temp and the walls of the basement would sweat, so cooling would not have
been a good approach in that environment.

Don, W4DH

At 02:30 AM 4/19/02, you wrote:
>Since I got my dividers built a couple of months ago, I have been able to
>monitor the drift on my rubidium, a FRK unit, against the Motorola Oncore
>VP gps 1 pps signal. What I have noticed, is the rubidium is temp
>sensitive, the warmer it runs, the faster I lose time. My rack was
>averaging around 88 degrees and the rubidium was losing around a
>microsecond a day. Thats a very expensive therometer.
>
>I put a cooling fan in the rack and blocked the airflow in the rack, so it
>sucks air from the bottom of the rack and exhuast it at the top. The rack
>is in the basement and the temp goes around 55 degrees in the winter to 70
>degrees in the summer. At the present, I have noticed the temp inside of
>the rack is averaging about 70 to 72 degrees. And now the rubidium is
>holding parts in the 12th.

>
>I have pondered a idea of maybe using some of the water cooling heat
>exchangers for computers to regulate the temp of the rubidium. I notice
>that several units are avilable that have pumps that run off of 12 volts,
>and thats lends itself to running off of the back up batteries.
>
>Any pro's and con's are welcomed. 73s - KD4FMN - Brian
>
>---
>You are currently subscribed to tacgps as: dhaselwood@ij.net
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Re: Rubidium Cooling

From: dan hinz <dan.hinz@ieee.org>
Date: Fri, 19 Apr 2002 18:27:49 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75317-2002.04.19-21.02.02--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For cooling, I would try a Peltier Junction an "electronic heat pump". I've
never used one, but they look very interesting. One place that you can buy
them is from www.allelectronics.com.

 I agree with the statements below on setting it just above the max expected or
even just below the min expected temperature. By setting it to an extreme, it
probably simplifies the control circuitry. Max temperature should minimize
energy consumption.

Good Luck,
Dan - W6LSN

Donald E Haselwood wrote:

> Brian,
>
> Is there a reason why you are not pursuing steering the Rb with the OnCore?
>
> I just got back to my steering project after a long diversion (everything
> from taxes on up). This last week I got the Rb steering using what I call
> a dog-simple hardware scheme and it works fine. Not having a better
> reference than gps, I can't really say what stability I'm achieving.
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> control to hold the short-term (such as the daily temp cycle) and gps for
> the longer term. I've thought about schemes for controlling the temp,
> however I checked the temp I found the air condx maintains the Rb in the 79
> - 82 deg F range over the 24 hour cycle. Consequently, controlling the Rb
> temp has been low on the "project list."
>
> Rather than work with cooling, it would seem that placing the Rb in a metal
> box, possibly with a fan to transfer heat from the Rb to the box, then
> holding the box at a constant temp slightly above the highest ambient, such
> as 72 deg F in your case, would be a way of maintaining constant temp at
> the Rb. At our previous QTH the dewpoint in the summer exceeded the ground
> temp and the walls of the basement would sweat, so cooling would not have
> been a good approach in that environment.
>
> Don, W4DH
>
> At 02:30 AM 4/19/02, you wrote:
> >Since I got my dividers built a couple of months ago, I have been able to
> >monitor the drift on my rubidium, a FRK unit, against the Motorola Oncore
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> >sensitive, the warmer it runs, the faster I lose time. My rack was
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> >microsecond a day. Thats a very expensive therometer.
> >
> >I put a cooling fan in the rack and blocked the airflow in the rack, so it
> >sucks air from the bottom of the rack and exhuast it at the top. The rack
> >is in the basement and the temp goes around 55 degrees in the winter to 70

> >degrees in the summer. At the present, I have noticed the temp inside of
> >the rack is averaging about 70 to 72 degrees. And now the rubidium is
> >holding parts in the 12th.
> >
> >I have pondered a idea of maybe using some of the water cooling heat
> >exchangers for computers to regulate the temp of the rubidium. I notice
> >that several units are avilable that have pumps that run off of 12 volts,
> >and thats lends itself to running off of the back up batteries.
> >
> >Any pro's and con's are welcomed. 73s - KD4FMN - Brian
> >
> >---
> >You are currently subscribed to tacgps as: dhaselwood@ij.net
> >To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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> >
>
> ---
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---
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5. [tacgps] RE: Rubidium Cooling

From: "Tom Clark \(W3IWI\)" <w3iwi@toad.net>
Date: Fri, 19 Apr 2002 23:29:24 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75332-2002.04.19-23.03.34--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Remember that there are reasons that there are reasons the Rb runs hot. The
main is that the Rb lamp is hot by its very nature. Then in a properly
designed system, the xtal will be cut to make use of this as an oven.

If you try to suck out too much heat, the thermal controller in the Rb will
just have to work that much harder to make up for the heat you are
extracting.

The best thing is to try to keep the temperature around it constant. I'd put
the Rb in an insulated temp chamber to isolate it from the outside world. I
have used a cardboard box and some "OK to be warm" insulating material so
that the room's air conditioner doesn't induce changes. But keep the
temperature stable!

If you put it in a box, affix some sort of temp monitor. I use the iButton
(Dallas Semi/Maxim) DS1921 logger and DS1920 or 18S20 one-wire devices here.
I'd also watch the current feeding the Rb. There will be a high "cold" value
which will throttle back when the oven warms up. You want to minimize the
amount of time that the oven is ON by watching for variations in the supply
current.

The typical Efratom M100 is quite happy with the small heat sink that comes
with them. I've also just bolted them to a large thermal mass (aluminum
plate) inside the "oven".

To use a Peltier pump to cool it, and then make the oven run more only helps
those who want to use more fossil fuels! Save a tree -- 73, Tom

---
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

6. [tacgps] RE: Rubidium Cooling

From: Mark Miller <markm@kramrellim.com>
Date: Sat, 20 Apr 2002 03:50:33 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75358-2002.04.20-04.24.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

My Efratom FRK-C2 does not have a heat sink, but there is a place to mount
one. Does anyone know where I can buy just a heat sink for this Rb osc ?

73

Mark N5RFX

At 23:29 4/19/02 -0400, you wrote:
>Remember that there are reasons that there are reasons the Rb runs hot. The
>main is that the Rb lamp is hot by its very nature. Then in a properly
>designed system, the xtal will be cut to make use of this as an oven.
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>If you try to suck out too much heat, the thermal controller in the Rb will
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>To use a Peltier pump to cool it, and then make the oven run more only helps
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>
>
>
>---
>You are currently subscribed to tacgps as: markm@kramrellim.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
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7. [tacgps] RE: Rubidium Cooling

From: "Robert Smith" <bobsmith5@earthlink.net>
Date: Sat, 20 Apr 2002 09:37:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75362-2002.04.20-09.11.53--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Lots of heat sinks at http://www.digikey.com .

    Bob Smith

---   Avoid computer viruses, Practice safe hex ---

-- Specializing in small, cost effective
    embedded control systems --

Robert L. (Bob) Smith
Smith Machine Works, Inc.
9900 Lumlay Road
Richmond, VA 23236   804/745-1065

  bobsmith5@earthlink.net

----- Original Message -----
From: "Mark Miller" <markm@kramrellim.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, April 20, 2002 4:50 AM
Subject: [tacgps] RE: Rubidium Cooling

> My Efratom FRK-C2 does not have a heat sink, but there is a place to mount
> one. Does anyone know where I can buy just a heat sink for this Rb osc ?
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> 73
> Mark N5RFX

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8. [tacgps] RE: Rubidium Cooling

From: kirbybq@hiwaay.net
Date: Sat, 20 Apr 2002 10:37:19 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75374-2002.04.20-11.11.27--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

For Dan:

Peltier junctions were out of the question - too much power draw considering
the battery backup system. My battery system is set up to hold the system up
for 48 hours. Current drawn by system is around 500 ma/hr after the rubdium is
warmed up. I use 28 a/h batteries and if I go much bigger, they would have to
go outdoors.

For Mark:

The rubidium heatsink is not very big. Its a little over 1/8 inch thick at the
base and fits over the end where the frequency ajustment access is. It has 12
fins, 6 on the left side and 6 on the right side. The fins are around 1/8
thich, with about the same for spacing in between. They are about 3/4 of an

inch long. The center of the heatsink has not fins.

For Donald:

I have reservations on disciplining the rubidium against GPS, as have never seen any performace data on the rubidium after modification. I do not have long term access to a cesium or maser to compare it after modification. WHile I'm sure that it works in the long term, I am specifically concerned with what it does in the short term. If you look at Allan variances for GPS vs. rubidium, the rubidium has much better short term stability, until you reach an elasped time of 10,000 seconds or so. A lot of rubidiums are better than a normal cesium as far as short term stability in the range of 100 to 1000 seconds. Temp is the worst environmental effect on the FRK rubidium. Its rated to hold 1-E9 from -25C to 65C. What I found from my recorded data, is if I can hold it at 70F, its very stable - in low parts of -E12.

I appreciate everybody's comments - Dr Clark hit it on the head. I need to determine the temp where the heaters are at minimum operation and the maximum temp to stabilize it considering the ambient environment.

Sounds like I need to retain the heat inside of the unit. My thought is to wrap the unit with some of the foam backed foil insulation and leave the heat sink exposed. Then a temp proportional control fan circuit mounted away from the heatsink, so it works without cooling, and when needed the fan comes in slowly, so the temp does not change fast. Maybe a current sense circuit, so the fan cannot come on when the heaters are running.

Thanks - 73s - KD4FMN - Brian

Be sure to listen for the Northeast Alabama 6M club on 50.150 Mhz, Monday thru Friday at 9PM Central time when the band opens. webpage at http://www.neasmn.org/

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9. [tacgps] RE: Rubidium Cooling

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Sun, 21 Apr 2002 12:29:43 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75588-2002.04.21-12.05.59--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brian,

>I have reservations on disciplining the rubidium against GPS, as have never
>seen any performace data on the rubidium after modification.

The modification should not affect the performance. It consists of connecting a wire from junction point in the resistor network that trims the frequency to the connector. I used a small resistor (couple of hundred ohms), rather than a wire, just to add a little protection from blunders, shaky hands, etc. Though the affect of the modification alone would be nil, it is the curiosity that initiates poking around into the other areas that might affect the performance ;)

I found that a 33K resistor from the pin to Gnd/+5v gave roughly a +/- 1E-10 control range. Fortuitously, the pin has an equivalent source voltage of 2.7v (and resistance of 265 ohms), so it works well with 5v logic. For a DAC I switch an I/O pin (0 - 5v) on the micro with a pwm duty cycle, which in turn drives a filter of consisting of three 10K resistors, in series, going to the Rb, with two 100 mfd caps. The phase detection is merely the input capture interrupt driven from the gps 1 pps, with the micro's clock driven by the Rb's 10 Mhz. The rest is software...

Your focus on the "short term" stability is indeed the key issue. I don't remember if those Allen variance curves were generated pre or post SA on the gps.

Anyway, your approach is interesting. Please keep me posted on what you come up with for temp controlling.

Don, W4DH

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10. [tacgps] Calculations with two sets of GPS coordinates

From: "Marius Hauki" <marius.hauki@datarespons.no>
Date: Mon, 22 Apr 2002 09:22:19 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75720-2002.04.22-02.56.38--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

This is pherhaps a little on the side, but still related
to GPS so please bear with me :

We want to calculate the bearing in degrees and elevation in
degrees between two GPS receivers (AZ/EL). One of the GPS receivers can
be located above ground.
The remote GPS receiver is transmitting its serial position datastring
to the other station via radio.
This looks like a trigonometric question. The problem is that I do not know
how to use LAT / LONG / HEIGHT to calculate the bearing and elevation.
I have heard that some GPS receivers also can transmit their position in
ZYZ format relative to the earths mass center. In that way is uses a
standard coordinate
system. Does anyone have the formulaes to solve this question ? Even better
some general source code that we can use ? Any help / links / contact
persons that can
help with this will be most welcome.

73 de LA9EEA
Marius

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11. [tacgps] RE: Calculations with two sets of GPS coordinates

From: "Flemming Larsen" <flarsen@earthlink.net>
Date: Mon, 22 Apr 2002 01:31:10 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75722-2002.04.22-04.05.23--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hej Marius,

For distances of a few kilometers, you can use simple plane
trigonometry, but for longer distances, you need to use spherical
trigonometry. Any book on Celestial Navigation will have the
information you need.

I have some experience in sailing and celestial navigation, and some
years ago, I wrote programs for solving celestial observations.

However, as a boat is usually expected to be on the surface of the
earth's surface (hopefully on the wet part!), I have never had to use
calculations that included elevation (height above the earth's sphere).

Once you do the calculations for the latitude/longitude differences,
I don't expect that it will be too difficult to calculate the straight-
line distance between the two GPS receivers, unless you have extreme
situations, such as one receiver being directly above the North Pole,
and the other being directly above the South Pole.

Here is a web link for calculating distances:

  http://www.indo.com/cgi-bin/dist

This link probably won't solve your trigonometry problems, but I find
it to be handy for calculating simple distance questions.

73,

-- Flemming Larsen, KB6ADS, ex. OZ6OI (Denmark)

> -----Original Message-----

>
> Subject: [tacgps] Calculations with two sets of GPS coordinates
>
>
> This is pherhaps a little on the side, but still related
> to GPS so please bear with me :
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> We want to calculate the bearing in degrees and elevation in
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> ZYZ format relative to the earths mass center. In that way is uses a
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> system. Does anyone have the formulaes to solve this question ?
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> help with this will be most welcome.
>
> 73 de LA9EEA
> Marius
>

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12. [tacgps] RE: Rubidium Cooling

From: "Bert Rathkamp" <rathkamp@cinci.rr.com>
Date: Mon, 22 Apr 2002 09:24:54 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75750-2002.04.22-08.59.13--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Gentlemen,

I will probably get my hands slapped over what I am going to say, but that
is the way I learn.

I am not interested where I am at or what time it is, I just want to know
what my frequency is ....

I thought for a while the way to go on the cheap for best frequency accuracy
was to steer a rubidium clock with the Motorola UT GPS chip. After a long
study, OK several hours, looking at "ALLAN VARIANCES" there is very little
difference from start up to 10000 seconds stability when using good crystals
steered via GPS or Rubidium.

The ALLAN VARIANCES charts generally conclude that good crystals steered via
GPS or Rubidium will be in the range of 1.E-13 after 24 hours. If you take a
GPS steered cheap or good crystal or a rubidium source they will all
stabilize to 1.E-11 to 1.E-12 in a little less than 3 hours and a little
over 24 hours will stabilize to 1.E-13 and maybe a little better. 1.E-12 is
a pico second or a trillionth or the inverse of a tera
1,000,000,000,000,000.

Remember the GPS or Rubidium steering devices need a stabilized crystal.

Crystals are cheaper!

To get the stability crystals need to be held to vary consistent
temperatures. Bury them in the ground. A good fence pole digger and 5 feet
PVC pipe buried vertically in the ground, do not extend the pipe above
ground, is a real stable environment if you put the crystal close to the
bottom. You need to go deeper if you live in a real cold climate.

Small crystal ovens are more expensive, and they need to be kept in a fairly
temperature stable environment, not in front of the heating/airconditioning
outlet.

Lets look at the crystal stability in another way. Crystals can be used to
check small temperature variations with great accuracy, thus the converse
can take place by varying temperature the frequency can change.

Too bad that the Brooks Shera interface board is no longer available, but I
am sure someone will come along to replace the loss.

A side bar comment to previous questions. Mini-Circuits make GPS antenna
splitters, 2,4,8 for around $60.00. I have not used on yet, but have been
told they work very well.

Bert Rathkamp W8AE

----- Original Message -----
From: "Donald E Haselwood" <dhaselwood@ij.net>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Sunday, April 21, 2002 12:29 PM
Subject: [tacgps] RE: Rubidium Cooling

> Brian,
>
> >I have reservations on disciplining the rubidium against GPS, as have
never
> >seen any performace data on the rubidium after modification.
>
> The modification should not affect the performance. It consists of
> connecting a wire from junction point in the resistor network that trims
> the frequency to the connector. I used a small resistor (couple of
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> ohms), rather than a wire, just to add a little protection from blunders,
> shaky hands, etc. Though the affect of the modification alone would be
> nil, it is the curiosity that initiates poking around into the other areas
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> I found that a 33K resistor from the pin to Gnd/+5v gave roughly a +/-
> 1E-10 control range. Fortuitously, the pin has an equivalent source
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> merely the input capture interrupt driven from the gps 1 pps, with the
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> Your focus on the "short term" stability is indeed the key issue. I don't
> remember if those Allen variance curves were generated pre or post SA on
> the gps.
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> Anyway, your approach is interesting. Please keep me posted on what you
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>
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> Don, W4DH
>
>
> ---
> You are currently subscribed to tacgps as: rathkamp@cinci.rr.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
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You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
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13. [tacgps] Re: Calculations with two sets of GPS coordinates

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 22 Apr 2002 08:28:05 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75752-2002.04.22-09.01.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I've got all these at the office, and thanks to a dying computer there,
I cannot get them from home. I'll look and reply later with specifics.

However, you may want to look at http://www.ngs.noaa.gov for the toolbox
page, and see what they've got there.

The 7-paramater transformation is easy enough for a problem of this sort.

gerry
--
Marius Hauki wrote:

> This is pherhaps a little on the side, but still related
> to GPS so please bear with me :
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> Marius
>
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

--
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] RE: Calculations with two sets of GPS coordinates

From: Gerry Creager N5JXS <gerry@cs.tamu.edu>
Date: Mon, 22 Apr 2002 08:35:47 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75754-2002.04.22-09.09.37--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

If distances are more than a 'few' km, I fully agree that use of a plane
system is problemmatic. However, the conversions are simple enough to
allow one to convet directly to cartesian coordinates, calculate a
vector, and transform back to the original system.

An additional word of caution: All data used for the transformations
should originate in WGS84, to make your life simpler. WGS84 represents
a relatively objective datum and ellipsoid. Use of some of the older
and more subjective systems (NAD27 comes to mind... but there are myriad
others) will allow transformation in both directions, but will be less
accurate when transforming from subjective to objective datums.

gerry
--
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> Hej Marius,
>
> For distances of a few kilometers, you can use simple plane
> trigonometry, but for longer distances, you need to use spherical
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> -- Flemming Larsen, KB6ADS, ex. OZ6OI (Denmark)
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>>-----Original Message-----
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>>Subject: [tacgps] Calculations with two sets of GPS coordinates
>>
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>>73 de LA9EEA
>>Marius
>>
>>
>
>
> ---
> You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

--
--
Gerry Creager -- gerry@cs.tamu.edu
Network Engineering
Academy for Advanced Telecommunications and Learning Technologies
Texas A&M University   979.458.4020 (Phone) -- 979.847.8578 (Fax)

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15. [tacgps] RE: Calculations with two sets of GPS coordinates

From: "Brooks Shera" <ebs@lanl.gov>
Date: Mon, 22 Apr 2002 11:39:42 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75788-2002.04.22-13.15.00--lyris.tacgps#tapr.org@lists.tapr.org>

Rendered body type: text/plain

Hi Marius, et al

There is a program on my webpage www.rt66.com/~shera, under the Surveying section, called GPS Survey Assistant. It will do exactly what you want, plus other things useful for comparing GPS surveying with local surveys.

For your purpose just enter the GPS positions of two locations (lat, longitude, altitude) and the Java program will compute the bearing, distance and elevation of the line of site. Actually it computes both the optical line of sight elevation, and the radio line of sight elevation. (The latter uses a larger earth radius to compensate for diffraction and is useful if you are setting up a radio link between two locations.) Let me know if you have any questions.

Brooks

----- Original Message -----
From: "Gerry Creager N5JXS" <gerry@cs.tamu.edu>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, April 22, 2002 7:35 AM
Subject: [tacgps] RE: Calculations with two sets of GPS coordinates

> If distances are more than a 'few' km, I fully agree that use of a plane
> system is problemmatic. However, the conversions are simple enough to
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> vector, and transform back to the original system.
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> and more subjective systems (NAD27 comes to mind... but there are myriad
> others) will allow transformation in both directions, but will be less
> accurate when transforming from subjective to objective datums.
>
> gerry
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You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

16. [tacgps] RE: Rubidium Cooling

From: "Brooks Shera" <ebs@lanl.gov>
Date: Mon, 22 Apr 2002 11:43:52 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75789-2002.04.22-13.18.16--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

The last I heard the PCB for my controller design was still available from
A&A Engineering (w6ucm@aol.com). If someone has trouble getting the board
please let me know.

Regards, Brooks.

>
> Too bad that the Brooks Shera interface board is no longer available, but
I
> am sure someone will come along to replace the loss.
>
> A side bar comment to previous questions. Mini-Circuits make GPS antenna
> splitters, 2,4,8 for around $60.00. I have not used on yet, but have been
> told they work very well.
>
> Bert Rathkamp W8AE
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

17. [tacgps] RE: Rubidium Cooling

From: "Bert Rathkamp" <rathkamp@cinci.rr.com>
Date: Mon, 22 Apr 2002 16:22:52 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75820-2002.04.22-15.57.18--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

Sorry .....

I have tried the Brooks Shera web site www.rt66.com and it says it does not exisit as per the following
and that includes most of last week?

The page cannot be found
The page you are looking for might have been removed, had its name changed, or is temporarily
unavailable.

Please try the following:

If you typed the page address in the Address bar, make sure that it is spelled correctly.

Open the www.rt66.com home page, and then look for links to the information you want.
Click the Back button to try another link.
HTTP 404 - File not found
Internet Information Services

Technical Information (for support personnel)

More information:
Microsoft Support

end of message

Bert
----- Original Message -----
From: "Brooks Shera" <ebs@lanl.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Monday, April 22, 2002 1:43 PM
Subject: [tacgps] RE: Rubidium Cooling

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> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

>
>

18. [tacgps] RE: Calculations with two sets of GPS coordinates

From: "Marius Hauki" <marius.hauki@datarespons.no>
Date: Tue, 23 Apr 2002 09:50:44 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75915-2002.04.23-03.25.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thanks Brooks. I checked the url you gave me, but there
is no info there. Could you please check if
something has happened with your site or server ?

Best regards
Marius

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> ----- Original Message -----
> From: "Gerry Creager N5JXS" <gerry@cs.tamu.edu>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Monday, April 22, 2002 7:35 AM
> Subject: [tacgps] RE: Calculations with two sets of GPS coordinates
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>>Gerry Creager -- gerry@cs.tamu.edu
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

19. [tacgps] Webpage problems

From: "Brooks Shera" <ebs@lanl.gov>
Date: Tue, 23 Apr 2002 08:09:25 -0600
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75948-2002.04.23-09.43.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Sorry about that. My ISP has decided to change servers and seems to be
having a lot of trouble with the change over. If they can't get the problem
solved soon, I'll switch to another webserver. Does anyone have any
suggestions? I tried Crosswinds.net yesterday but they seem to have
problems also.

Brooks

----- Original Message -----
From: "Marius Hauki" <marius.hauki@datarespons.no>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, April 23, 2002 1:50 AM
Subject: [tacgps] RE: Calculations with two sets of GPS coordinates

> Thanks Brooks. I checked the url you gave me, but there
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> something has happened with your site or server ?
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> > From: "Gerry Creager N5JXS" <gerry@cs.tamu.edu>
> > To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> > Sent: Monday, April 22, 2002 7:35 AM
> > Subject: [tacgps] RE: Calculations with two sets of GPS coordinates
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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

20. [tacgps] RE: Webpage problems

From: "Rick Hambly \(W2GPS\)" <w2gps@cnssys.com>
Date: Tue, 23 Apr 2002 10:43:30 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75949-2002.04.23-10.17.47--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks,

http://ns2.rt66.com/~shera/ seems to work OK.

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of Brooks Shera
Sent: Tuesday, April 23, 2002 10:09 AM
To: TAPR Special Interest Group
Subject: [tacgps] Webpage problems

Sorry about that. My ISP has decided to change servers and seems to be
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From: "Marius Hauki" <marius.hauki@datarespons.no>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, April 23, 2002 1:50 AM
Subject: [tacgps] RE: Calculations with two sets of GPS coordinates

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> >>> http://www.indo.com/cgi-bin/dist
> >>>
> >>>This link probably won't solve your trigonometry problems, but I
> >>>find it to be handy for calculating simple distance questions.
> >>>
> >>>73,
> >>>
> >>>-- Flemming Larsen, KB6ADS, ex. OZ6OI (Denmark)
> >>>
> >>>
> >>>
> >>>
> >>>
> >>>
> >>>
> >>>-----Original Message-----
> >>>
> >>>Subject: [tacgps] Calculations with two sets of GPS coordinates
> >>>
> >>>
> >>>This is pherhaps a little on the side, but still related to GPS so

> >>>please bear with me :
> >>>
> >>>We want to calculate the bearing in degrees and elevation in
> >>>degrees between two GPS receivers (AZ/EL). One of the GPS
> >>>receivers
can
> >>>be located above ground.
> >>>The remote GPS receiver is transmitting its serial position
> >>>datastring to the other station via radio. This looks like a
> >>>trigonometric question. The problem is that I do not know
> >>>how to use LAT / LONG / HEIGHT to calculate the bearing and
elevation.
> >>>I have heard that some GPS receivers also can transmit their
position
in
> >>>ZYZ format relative to the earths mass center. In that way is uses

> >>>a standard coordinate system. Does anyone have the formulaes to
> >>>solve this question ? Even better
> >>>some general source code that we can use ? Any help / links /
contact
> >>>persons that can
> >>>help with this will be most welcome.
> >>>
> >>>73 de LA9EEA
> >>>Marius
> >>>
> >>>
> >>>
> >>>
> >>>---
> >>>You are currently subscribed to tacgps as: gerry@cs.tamu.edu To
> >>>unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >>>
> >>>
> >>>
> >>>--
> >>>--
> >>>Gerry Creager -- gerry@cs.tamu.edu
> >>>Network Engineering
> >>>Academy for Advanced Telecommunications and Learning Technologies
> >>>Texas A&M University 979.458.4020 (Phone) -- 979.847.8578 (Fax)
> >>>
> >>>
> >>>---
> >>>You are currently subscribed to tacgps as: EBS@LANL.GOV

> >>To unsubscribe send a blank email to
> >>leave-tacgps-6754G@lists.tapr.org
> >>
> >>
> >
> >
> > ---
> > You are currently subscribed to tacgps as: MARIUS@DATARESPONS.NO To
> > unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
> >
> >
> >
>
>
>
> ---
> You are currently subscribed to tacgps as: EBS@LANL.GOV
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: W2GPS@CNSSYS.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

21. [tacgps] RE: Webpage problems

From: jim_johnson@agilent.com
Date: Tue, 23 Apr 2002 08:34:05 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75966-2002.04.23-11.08.26--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Hmm, that doesn't work for me, Rick. Here's what I got in response:

While trying to retrieve the URL: http://ns2.rt66.com/~shera/

The following error was encountered:

Unable to determine IP address from host name for ns2.rt66.com
The dnsserver returned:

Name Error: The domain name does not exist.

73,
Jim W6SC

> -----Original Message-----
> From: Rick Hambly (W2GPS) [mailto:w2gps@cnssys.com]
> Sent: Tuesday, April 23, 2002 7:44 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Webpage problems
>
>
> Brooks,
>
> http://ns2.rt66.com/~shera/ seems to work OK.
>
> Rick
> W2GPS
>
> -----Original Message-----
> From: bounce-tacgps-5621@lists.tapr.org
> [mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of Brooks Shera
> Sent: Tuesday, April 23, 2002 10:09 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Webpage problems
>

>
> Sorry about that. My ISP has decided to change servers and
> seems to be
> having a lot of trouble with the change over. If they can't get the
> problem solved soon, I'll switch to another webserver. Does
> anyone have
> any suggestions? I tried Crosswinds.net yesterday but they
> seem to have
> problems also.
>
> Brooks
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

22. [tacgps] RE: Webpage problems

From: "Rick Hambly \(W2GPS\)" <w2gps@cnssys.com>
Date: Tue, 23 Apr 2002 12:11:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75973-2002.04.23-11.46.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Then try

http://208.254.80.2/~shera/

Rick
W2GPS

-----Original Message-----
From: bounce-tacgps-5621@lists.tapr.org
[mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of
jim_johnson@agilent.com
Sent: Tuesday, April 23, 2002 11:34 AM
To: TAPR Special Interest Group
Subject: [tacgps] RE: Webpage problems

Hmm, that doesn't work for me, Rick. Here's what I got in response:

While trying to retrieve the URL: http://ns2.rt66.com/~shera/

The following error was encountered:

Unable to determine IP address from host name for ns2.rt66.com
The dnsserver returned:

Name Error: The domain name does not exist.

73,
Jim W6SC

> -----Original Message-----
> From: Rick Hambly (W2GPS) [mailto:w2gps@cnssys.com]
> Sent: Tuesday, April 23, 2002 7:44 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Webpage problems
>
>
> Brooks,
>
> http://ns2.rt66.com/~shera/ seems to work OK.
>
> Rick
> W2GPS
>
> -----Original Message-----
> From: bounce-tacgps-5621@lists.tapr.org
> [mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of Brooks Shera

> Sent: Tuesday, April 23, 2002 10:09 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] Webpage problems
>
>
> Sorry about that. My ISP has decided to change servers and
> seems to be
> having a lot of trouble with the change over. If they can't get the
> problem solved soon, I'll switch to another webserver. Does
> anyone have
> any suggestions? I tried Crosswinds.net yesterday but they
> seem to have
> problems also.
>
> Brooks
>

You are currently subscribed to tacgps as: W2GPS@CNSSYS.COM
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

23. [tacgps] RE: Webpage problems

From: "Bert Rathkamp" <rathkamp@cinci.rr.com>
Date: Tue, 23 Apr 2002 14:49:47 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-75997-2002.04.23-14.24.14--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rick,

Brook's web site up snd running with the exception of being able to download
software which are the last 3 items on the frequency/clock page. I just
treid to download at 2:45 ESDT.

Bert W8AE

----- Original Message -----
From: "Rick Hambly (W2GPS)" <w2gps@cnssys.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, April 23, 2002 12:11 PM
Subject: [tacgps] RE: Webpage problems

> Then try
>
> http://208.254.80.2/~shera/
>
> Rick
> W2GPS
>
> -----Original Message-----
> From: bounce-tacgps-5621@lists.tapr.org
> [mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of
> jim_johnson@agilent.com
> Sent: Tuesday, April 23, 2002 11:34 AM
> To: TAPR Special Interest Group
> Subject: [tacgps] RE: Webpage problems
>
>
> Hmm, that doesn't work for me, Rick. Here's what I got in response:
>
> --
> ----
> ----------------------
> While trying to retrieve the URL: http://ns2.rt66.com/~shera/
>
> The following error was encountered:
>
> Unable to determine IP address from host name for ns2.rt66.com
> The dnsserver returned:
>
> Name Error: The domain name does not exist.
> --

> ----
> ----------------------
>
> 73,
> Jim W6SC
>
>
>
> > -----Original Message-----
> > From: Rick Hambly (W2GPS) [mailto:w2gps@cnssys.com]
> > Sent: Tuesday, April 23, 2002 7:44 AM
> > To: TAPR Special Interest Group
> > Subject: [tacgps] RE: Webpage problems
> >
> >
> > Brooks,
> >
> > http://ns2.rt66.com/~shera/ seems to work OK.
> >
> > Rick
> > W2GPS
> >
> > -----Original Message-----
> > From: bounce-tacgps-5621@lists.tapr.org
> > [mailto:bounce-tacgps-5621@lists.tapr.org] On Behalf Of Brooks Shera
> > Sent: Tuesday, April 23, 2002 10:09 AM
> > To: TAPR Special Interest Group
> > Subject: [tacgps] Webpage problems
> >
> >
> > Sorry about that. My ISP has decided to change servers and
> > seems to be
> > having a lot of trouble with the change over. If they can't get the
> > problem solved soon, I'll switch to another webserver. Does
> > anyone have
> > any suggestions? I tried Crosswinds.net yesterday but they
> > seem to have
> > problems also.
> >
> > Brooks
> >
>
> ---
> You are currently subscribed to tacgps as: W2GPS@CNSSYS.COM
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>
>
> ---
> You are currently subscribed to tacgps as: rathkamp@cinci.rr.com
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

24. [tacgps] Re: Webpage problems

From: "Robert Smith" <bobsmith5@earthlink.net>
Date: Wed, 24 Apr 2002 07:00:37 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76100-2002.04.24-06.35.03--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Brooks --

After putting up with a rash of such problems, I finally moved to
http://www.earthlink.net . They are less than perfect but seem to be able
to keep it going.

    Bob Smith

---   Avoid computer viruses, Practice safe hex ---

-- Specializing in small, cost effective
    embedded control systems --

Robert L. (Bob) Smith
Smith Machine Works, Inc.
9900 Lumlay Road
Richmond, VA 23236   804/745-1065

  bobsmith5@earthlink.net

----- Original Message -----
From: "Brooks Shera" <ebs@lanl.gov>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Tuesday, April 23, 2002 10:09 AM
Subject: [tacgps] Webpage problems

> Sorry about that. My ISP has decided to change servers and seems to be
> having a lot of trouble with the change over. If they can't get the
problem
> solved soon, I'll switch to another webserver. Does anyone have any
> suggestions? I tried Crosswinds.net yesterday but they seem to have
> problems also.
>
> Brooks
>
>
> ----- Original Message -----
> From: "Marius Hauki" <marius.hauki@datarespons.no>
> To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> Sent: Tuesday, April 23, 2002 1:50 AM
> Subject: [tacgps] RE: Calculations with two sets of GPS coordinates
>
>
> > Thanks Brooks. I checked the url you gave me, but there
> > is no info there. Could you please check if
> > something has happened with your site or server ?
> >
> > Best regards
> > Marius
> >
> >
> > Brooks Shera wrote:
> >
> > > Hi Marius, et al
> > >
> > > There is a program on my webpage www.rt66.com/~shera, under the
> Surveying
> > > section, called GPS Survey Assistant. It will do exactly what you
want,
> > > plus other things useful for comparing GPS surveying with local
surveys.
> > >
> > > For your purpose just enter the GPS positions of two locations (lat,
> > > longitude, altitude) and the Java program will compute the bearing,
> distance
> > > and elevation of the line of site. Actually it computes both the
> optical
> > > line of sight elevation, and the radio line of sight elevation. (The
> latter
> > > uses a larger earth radius to compensate for diffraction and is useful
> if
> > > you are setting up a radio link between two locations.) Let me know
if
> you
> > > have any questions.
> > >
> > > Brooks
> > >
> > >
> > > ----- Original Message -----
> > > From: "Gerry Creager N5JXS" <gerry@cs.tamu.edu>
> > > To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
> > > Sent: Monday, April 22, 2002 7:35 AM
> > > Subject: [tacgps] RE: Calculations with two sets of GPS coordinates
> > >
> > >
> > >
> > >
> > >>If distances are more than a 'few' km, I fully agree that use of a
plane
> > >>system is problemmatic. However, the conversions are simple enough to

> > >>allow one to convet directly to cartesian coordinates, calculate a
> > >>vector, and transform back to the original system.
> > >>
> > >>An additional word of caution: All data used for the transformations
> > >>should originate in WGS84, to make your life simpler. WGS84
represents
> > >>a relatively objective datum and ellipsoid. Use of some of the older
> > >>and more subjective systems (NAD27 comes to mind... but there are
myriad
> > >>others) will allow transformation in both directions, but will be less
> > >>accurate when transforming from subjective to objective datums.
> > >>
> > >>gerry
> > >>--
> > >>Flemming Larsen wrote:
> > >>
> > >>
> > >>>Hej Marius,
> > >>>
> > >>>For distances of a few kilometers, you can use simple plane
> > >>>trigonometry, but for longer distances, you need to use spherical
> > >>>trigonometry. Any book on Celestial Navigation will have the
> > >>>information you need.
> > >>>
> > >>>I have some experience in sailing and celestial navigation, and some
> > >>>years ago, I wrote programs for solving celestial observations.
> > >>>
> > >>>However, as a boat is usually expected to be on the surface of the
> > >>>earth's surface (hopefully on the wet part!), I have never had to use
> > >>>calculations that included elevation (height above the earth's
sphere).
> > >>>
> > >>>Once you do the calculations for the latitude/longitude differences,
> > >>>I don't expect that it will be too difficult to calculate the
straight-
> > >>>line distance between the two GPS receivers, unless you have extreme
> > >>>situations, such as one receiver being directly above the North Pole,
> > >>>and the other being directly above the South Pole.
> > >>>
> > >>>Here is a web link for calculating distances:
> > >>>
> > >>> http://www.indo.com/cgi-bin/dist
> > >>>
> > >>>This link probably won't solve your trigonometry problems, but I find
> > >>>it to be handy for calculating simple distance questions.
> > >>>
> > >>>73,
> > >>>
> > >>>-- Flemming Larsen, KB6ADS, ex. OZ6OI (Denmark)
> > >>>
> > >>>
> > >>>
> > >>>
> > >>>
> > >>>
> > >>>
> > >>>-----Original Message-----
> > >>>
> > >>>Subject: [tacgps] Calculations with two sets of GPS coordinates
> > >>>
> > >>>
> > >>>This is pherhaps a little on the side, but still related
> > >>>to GPS so please bear with me :
> > >>>
> > >>>We want to calculate the bearing in degrees and elevation in
> > >>>degrees between two GPS receivers (AZ/EL). One of the GPS receivers
> can
> > >>>be located above ground.
> > >>>The remote GPS receiver is transmitting its serial position
datastring
> > >>>to the other station via radio.
> > >>>This looks like a trigonometric question. The problem is that I
> > >>>do not know
> > >>>how to use LAT / LONG / HEIGHT to calculate the bearing and
elevation.
> > >>>I have heard that some GPS receivers also can transmit their
position
> in
> > >>>ZYZ format relative to the earths mass center. In that way is uses a

> > >>>>standard coordinate
> > >>>>system. Does anyone have the formulaes to solve this question ?
> > >>>>Even better
> > >>>>some general source code that we can use ? Any help / links /
contact
> > >>>>persons that can
> > >>>>help with this will be most welcome.
> > >>>>
> > >>>>73 de LA9EEA
> > >>>>Marius
> > >>>>
> > >>>>
> > >>>>
> > >>>
> > >>>---
> > >>>You are currently subscribed to tacgps as: gerry@cs.tamu.edu
> > >>>To unsubscribe send a blank email to
leave-tacgps-6754G@lists.tapr.org
> > >>>
> > >>>
> > >>
> > >>--
> > >>--
> > >>Gerry Creager -- gerry@cs.tamu.edu
> > >>Network Engineering
> > >>Academy for Advanced Telecommunications and Learning Technologies
> > >>Texas A&M University 979.458.4020 (Phone) -- 979.847.8578 (Fax)
> > >>
> > >>
> > >>---
> > >>You are currently subscribed to tacgps as: EBS@LANL.GOV
> > >>To unsubscribe send a blank email to
leave-tacgps-6754G@lists.tapr.org
> > >>
> > >>
> > >
> > >
> > >---
> > >You are currently subscribed to tacgps as: MARIUS@DATARESPONS.NO
> > >To unsubscribe send a blank email to
leave-tacgps-6754G@lists.tapr.org
> > >
> > >
> > >
> >
> >
> >
> > ---
> > You are currently subscribed to tacgps as: EBS@LANL.GOV
> > To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
> >
>
>
> ---
> You are currently subscribed to tacgps as: bobsmith5@earthlink.net
> To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
>
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

25. [tacgps] Re: GPS Calcs

From: kirbybq@hiwaay.net
Date: Wed, 24 Apr 2002 06:40:11 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76103-2002.04.24-07.14.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I beleive inverse3d at NGS will preform the calcs you want to do, between two
GPS points. Look in the software section.

http://www.ngs.noaa.gov

you have to seperate the data when entering it; ie: 34 38 09.7 as one entry

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

26. [tacgps] Re: Rubidium Cooling II

From: kirbybq@hiwaay.net
Date: Wed, 24 Apr 2002 07:16:46 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76107-2002.04.24-07.51.04--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I found some interesting reading at David Allan's site:
http://www.allanstime.com/

He has several papers on line. The first one, "Prescision Oscillators: Dependence of Frequency on Temperature, Humidity and Pressure" goes over issues for quartz, rubidium, cesium, and hydrogen masers. He confirms several of the issues we have been over, and one I did not know about on rubidiums - helium in the ambinent has a bad effect on the physics package. After reading the paper, it looks like one of the best things that could be done, is to put the rubidium in a vacumn vessel !

He also has a paper "A No-drift and less than 10-13 Long-term Stability Quartz Oscillator Using a GPS SA filter" that goes over GPS disiplined quartz oscillators. It covers something I had on my mind about the short term stability of steered oscillators.

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

27. [tacgps] Digital BASH Update

From: John Ackermann N8UR <jra@febo.com>
Date: Wed, 24 Apr 2002 11:21:33 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-76160-2002.04.24-11.00.57--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

We're very happy to announce that Bdale Garbe, KB0G, will be the keynote speaker at the TAPR/MVFMA Digital BASH on Friday evening at Hamvention.

Bdale is one of the long-time "good guys" in the digital radio and amateur satellite worlds. He was in the middle of the early work on KA9Q's "NET" and "NOS" programs, pioneered megabit-rate packet radio, and in the satellite world was heavily involved in the RUDAK and AO-40 GPS experiments. Back in the Old Days, he was a board member and Vice President of TAPR, and remains one of TAPR's best friends. On a different front, Bdale was just elected as Debian Project Leader, so he now oversees one of the major Linux distributions -- and the one that is by far the most ham-friendly. Bdale works in the Linux development group at HP, and in his spare (?) time does VHF/UHF/microwave contesting and roaming.

Bdale's talk will blend all of these interests into an entertaining and informative presentation titled "From Bits in the Basement to Debian -- and Back Again".

You can find more information about the Digital BASH and TAPR's other Hamvention activities at http://www.tapr.org/tapr/dayton/.

See you there!

73,
John

John Ackermann N8UR jra@febo.com http://www.febo.com
President, TAPR n8ur@tapr.org http://www.tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

28. [tacgps] RE: Rubidium Cooling

From: Donald E Haselwood <dhaselwood@ij.net>
Date: Wed, 24 Apr 2002 20:11:29 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-76296-2002.04.24-19.51.21--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Rather than control the "environmental temp" for the Rb, why not apply a
"steering" correction based on the temp of the Rb. Any thoughts about this
approach?

It seems like the critical issue is that the temp sensing (e.g. a
thermistor at the base of the heat sink) will not be at the same place as
the temp sensitive parts, resulting a lag between a sensed temp change and
the effect on the freq. It would therefore be important to keep the Rb out
of drafts so that temp changes are gradual.

The hardware for coupling the temp sensing with the gps steering is easy.
Just add a thermistor/op amp. I had been toying with ideas for controlling
the flow of outside air through a box containing the Rb, something that
requires sensing temp, when the "forward compensation" idea popped
up...forget the fan, and just retained the temp sensing.

Don

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

29. [tacgps] Ovenaire Precision Xtal Osc.

From: Alberto di Bene <dibene@usa.net>
Date: Thu, 25 Apr 2002 23:06:02 +0200
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Cc: Time Nuts <time-nuts@febo.com>,
        TAPR HF Special Interest Group <hfsig@lists.tapr.org>
Message-ID: <LYR6754-76480-2002.04.25-16.41.52--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I am looking for the pinout and specs of the
Precision Crystal Oscillator Mod. OSC 49-11
made by Ovenaire Audio Carpenter.
It is an ovenized unit, 3 MHz, found at an hamfest.
I have been unable to find anything on the Internet.

Thanks for any data

73 Alberto I2PHD

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

May 2002

Original source file: tacgps.0205
Source: http://ftp.tapr.org/product_docs/TAC2/mail_archives/tacgps.0205

1. [tacgps] Spring _Packet_Status_Register_ Available Online

From: "John R. Ackermann" <jra@febo.com>
Date: Thu, 02 May 2002 20:26:04 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-77561-2002.05.02-20.07.01--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

As the subject says... the new issue of TAPR's journal, the
_Packet_Status_Register_, is now available online. You can go to
http://www.tapr.org/tapr/html/Fpsr.html, or obtain it via ftp from
ftp://ftp.tapr.org/psr/Spring_83_2002.pdf. You'll need Adobe Acrobat or
other PDF file reader to view the document.

Stan Horzepa, WA1LOU, has taken the reins as the PSR's editor, and I'd like
to thank him for his great work on this issue. Please send comments,
suggestions, or -- best of all -- articles to Stan at psr@tapr.org.

73,
John N8UR

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

2. [tacgps] GPS time

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Thu, 9 May 2002 16:27:52 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78486-2002.05.09-19.10.49--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Dear Tom and group,

  As a timing backup I bought one of the HP Z3801 GPS timing receivers and I
made the RS-422/RS-232 interface. I also built the AC supply neatly within the
chassis. The status page shows that it is now tracking very well since I
re-initialized the position using the appropriate 'survey' command.

One thing I don't understand however, is the significant difference between the
GPS time (in UTC) as seen on the Z3801 "status page" viewed in near real time on
a notebook computer and listening to WWV at the same time. If anything, I would
expect the GPS time to be very slightly lagging WWV time but instead the GPS
time is nearly a full 10 seconds ahead of WWV. Please explain this to me.

If anyone is interested, I have taken a digital photo showing the power supply
addition to the Z3801 chassis and I can email it to you individually if you ask
me for it. I did not want to trouble the entire group by sending an attachment.

73,

Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

3. [tacgps] Re: GPS time

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Thu, 9 May 2002 16:47:22 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78487-2002.05.09-19.28.50--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Jeffrey,

GPS time is ahead of UTC by 13 seconds these days.

What tool do you use to display the time? I suspect
your "near real-time" is closer to a 3 second lag. For

example the sum of the delays of your PC sending a
RS-232 command, the Z3801A responding to it, the
PC receiving the data, and displaying the result. The
net result is that your PC might display UTC + 13 - 3,
which is UTC - 10 seconds.

By the way, to change the default Z3801A time display
from GPS to UTC send it the following command and
power cycle:

    DIAG:GPS:UTC 1

/tvb

----- Original Message -----
From: "Jeffrey Pawlan" <jpawlan@pawlan.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Thursday, May 09, 2002 16:27
Subject: [tacgps] GPS time

> Dear Tom and group,
>
>   As a timing backup I bought one of the HP Z3801 GPS timing receivers and
I
> made the RS-422/RS-232 interface. I also built the AC supply neatly within
the
> chassis. The status page shows that it is now tracking very well since I
> re-initialized the position using the appropriate 'survey' command.
>
> One thing I don't understand however, is the significant difference
between the
> GPS time (in UTC) as seen on the Z3801 "status page" viewed in near real
time on
> a notebook computer and listening to WWV at the same time. If anything, I
would
> expect the GPS time to be very slightly lagging WWV time but instead the
GPS
> time is nearly a full 10 seconds ahead of WWV. Please explain this to me.
>
> If anyone is interested, I have taken a digital photo showing the power
supply
> addition to the Z3801 chassis and I can email it to you individually if
you ask
> me for it. I did not want to trouble the entire group by sending an
attachment.
>
> 73,
>
> Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

4. [tacgps] Re: GPS time

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Thu, 9 May 2002 17:38:20 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78490-2002.05.09-20.21.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

On Thu, 9 May 2002, Tom Van Baak wrote:

> Jeffrey,
>
> GPS time is ahead of UTC by 13 seconds these days.
>
> What tool do you use to display the time? I suspect
> your "near real-time" is closer to a 3 second lag. For
> example the sum of the delays of your PC sending a
> RS-232 command, the Z3801A responding to it, the
> PC receiving the data, and displaying the result. The
> net result is that your PC might display UTC + 13 - 3,
> which is UTC - 10 seconds.
>

> By the way, to change the default Z3801A time display
> from GPS to UTC send it the following command and
> power cycle:
>
>   DIAG:GPS:UTC 1
>

You are correct that there is around a 3 sec delay for the communication and
display of the status screen. Although I initially used a terminal program
(Telix), I found that the supplied GPS-STAT program made for this particular
receiver is very easy to use and works well.

I sent the command, powered off, then the time was indeed around 3 sec. BEHIND
WWV now. I still don't know why GPS time is different than UTC.

I also find that this particular Z3801 has a very well defined range of power
supply voltages that it requires. The normal range is 48 - 60v and the manual
says it should begin operation down to 37v. My unit requires 47v min and 60v
max. When the oven is already hot, the load on the unregulated supply I built
inside jumps up to just over 60v and the receiver will not start. So I will need
to add either a large Zener or a series regulator. Have you checked yours for
voltage startup sensitivity while the unit was fully warm?

73,

Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

5. [tacgps] TRAK 8820

From: "Bert Rathkamp" <rathkamp@cinci.rr.com>
Date: Thu, 9 May 2002 21:37:22 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78495-2002.05.09-21.12.33--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

To all,

Does anyone have an answer to make a TRAK 8820 work. It shows position and altitude no problem. If you
put 02 in year date it thinks it is 1902. It will not lock on because of a Y2K problem which TRAK will
fix for $2000.

Bert

6. [tacgps] Re: GPS time

From: kirbybq@hiwaay.net
Date: Thu, 09 May 2002 21:09:21 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78514-2002.05.09-21.44.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

GPS time is referenced to UTC starting 0000Z on Jan 6th, 1980.

UTC is periodically corrected by introducing leap seconds, etc.

GPS is not corrected because it would introduce navigation errors/offsets. I
read somewhere that corrections would affect user range accuracy. It had
something to do with the speed of light and time of transmission and the WGS-84
specs and how the solution is calculated.

The way they get around it, is they put an time offset in a navigation message,
that tells the receiver to add so many seconds to GPS time to obtain UTC. Its
up to the maker of the unit to incorporate it for a real time display.

Quoting Jeffrey Pawlan <jpawlan@pawlan.com>:

> On Thu, 9 May 2002, Tom Van Baak wrote:
>
> > Jeffrey,
> >
> > GPS time is ahead of UTC by 13 seconds these days.

> >
> > What tool do you use to display the time? I suspect
> > your "near real-time" is closer to a 3 second lag. For
> > example the sum of the delays of your PC sending a
> > RS-232 command, the Z3801A responding to it, the
> > PC receiving the data, and displaying the result. The
> > net result is that your PC might display UTC + 13 - 3,
> > which is UTC - 10 seconds.
> >
> > By the way, to change the default Z3801A time display
> > from GPS to UTC send it the following command and
> > power cycle:
> >
> >   DIAG:GPS:UTC 1
> >
>
> You are correct that there is around a 3 sec delay for the communication
> and
> display of the status screen. Although I initially used a terminal
> program
> (Telix), I found that the supplied GPS-STAT program made for this
> particular
> receiver is very easy to use and works well.
>
> I sent the command, powered off, then the time was indeed around 3 sec.
> BEHIND
> WWV now. I still don't know why GPS time is different than UTC.
>
>
> I also find that this particular Z3801 has a very well defined range of
> power
> supply voltages that it requires. The normal range is 48 - 60v and the
> manual
> says it should begin operation down to 37v. My unit requires 47v min and
> 60v
> max. When the oven is already hot, the load on the unregulated supply I
> built
> inside jumps up to just over 60v and the receiver will not start. So I
> will need
> to add either a large Zener or a series regulator. Have you checked
> yours for
> voltage startup sensitivity while the unit was fully warm?
>
> 73,
>
> Jeffrey Pawlan, WA6KBL
>
>
>
>
>
> ---
> You are currently subscribed to tacgps as: kirbybq@hiwaay.net
> To unsubscribe send a blank email to
> leave-tacgps-6754G@lists.tapr.org
>

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

7. [tacgps] Re: GPS time

From: "Tom Van Baak" <tvb@leapsecond.com>
Date: Thu, 9 May 2002 19:31:38 -0700
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78515-2002.05.09-22.13.20--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> You are correct that there is around a 3 sec delay for the communication
and
> display of the status screen. Although I initially used a terminal program
> (Telix), I found that the supplied GPS-STAT program made for this
particular
> receiver is very easy to use and works well

You could reduce the delay by writing your own program
to send the PTIM:TIME? command instead of the much
more verbose SYST:STAT? command.

However, most people who need sub-second accuracy

use the 1 PPS signal rather than depend on the timing
of the RS-232 output.

> I sent the command, powered off, then the time was indeed around 3 sec.
BEHIND
> WWV now. I still don't know why GPS time is different than UTC.

GPS time is offset from UTC due to leap seconds.

Every now and then, based on precise measurements
of the earth's rotation, an extra second is added to UTC
to keep "atomic time" within a second of "earth time".

Unlike leap days (February 29) we cannot predict too
far in advance when a leap second (23:59:60) will be
necessary. It depends on complex sub-millisecond
variations in the earth rotation rate.

Anyway some autonomous timing systems find the
unpredictable insertion of an extra second a major
pain so by design they just avoid the problem by
creating their own time scale - where every minute
still has 60 seconds no matter what. Examples are
Loran-C, GPS, cell phones (CDMA?), and perhaps
others.

GPS receivers and cell phones can still display UTC
because the leap second offset is also included as
part of the data stream.

> I also find that this particular Z3801 has a very well defined range of
power
> supply voltages that it requires. The normal range is 48 - 60v and the
manual
> says it should begin operation down to 37v. My unit requires 47v min and
60v
> max. When the oven is already hot, the load on the unregulated supply I
built
> inside jumps up to just over 60v and the receiver will not start. So I
will need
> to add either a large Zener or a series regulator. Have you checked yours
for
> voltage startup sensitivity while the unit was fully warm?
>
> 73,
>
> Jeffrey Pawlan, WA6KBL

The manual must be wrong. Most of us find 48 V pretty
much the minimum.

/tvb

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To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

8. [tacgps] Re: GPS time

From: "Timothy J. Salo" <salo@saloits.com>
Date: Thu, 9 May 2002 22:25:29 -0500 (CDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78519-2002.05.09-23.00.28--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

> Date: Thu, 9 May 2002 17:38:20 -0700 (PDT)
> From: Jeffrey Pawlan <jpawlan@pawlan.com>
> Subject: [tacgps] Re: GPS time
>   [...]
> I still don't know why GPS time is different than UTC.
>   [...]

See, for example:

        http://tycho.usno.navy.mil/leapsec.html
        http://tycho.usno.navy.mil/leap.html

When you are done with that, and have some time, you might want

to read everything else on tycho.

And, of course, this is the Internet, so check out (particularly the
links):

        http://www.leapsecond.com/

-tjs

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

9. [tacgps] Re: GPS time

From: Jeffrey Pawlan <jpawlan@pawlan.com>
Date: Thu, 9 May 2002 20:35:11 -0700 (PDT)
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-78520-2002.05.09-23.18.06--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Thank you everyone for your help explaining this subject and also the reference
links. It makes sense to me now.

73,

Jeffrey Pawlan, WA6KBL

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

10. [tacgps] Z3801A (fwd)

From: John Ackermann N8UR <jra@febo.com>
Date: Wed, 22 May 2002 10:31:13 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80382-2002.05.22-10.06.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Here's the first of two messages I received recently offering large numbers
of Z3801A's for sale.

John
---------- Forwarded Message ----------
Date: Tuesday, May 14, 2002 4:24 PM -0700
From: Mike <mike@hitechcafe.com>
To: jra@febo.com
Subject: Z3801A

Any chance you need more of these GPS units I have 1600 in stock. If you
or any friends are looking for one I have them for sale at $349
http://www.febo.com/time-freq/gps/

MIKE PAYNE
HITECH COMPONENTS
775 356 1777 EXT 329
775 356 7801 FAX
www.hitechcafe.com

---------- End Forwarded Message ----------

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

---------- End Forwarded Message ----------

```
----
John Ackermann    N8UR         jra@febo.com     http://www.febo.com
President, TAPR                n8ur@tapr.org    http://www.tapr.org


---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

11. [tacgps] Z3801A (part 2) (fwd)

```
From: John Ackermann   N8UR <jra@febo.com>
Date: Wed, 22 May 2002 10:31:48 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80383-2002.05.22-10.07.31--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

This is the second -- he has 1600 of 'em!

John

```
---------- Forwarded Message ----------
Date: Tuesday, May 14, 2002 4:24 PM -0700
From: Mike <mike@hitechcafe.com>
To: jra@febo.com
Subject: Z3801A


Any chance you need more of these GPS units I have 1600 in stock.  If you
or any friends are looking for one I have them for sale at $349
http://www.febo.com/time-freq/gps/


MIKE PAYNE
HITECH COMPONENTS
775 356 1777 EXT 329
775 356 7801 FAX
www.hitechcafe.com



---------- End Forwarded Message ----------



----
John Ackermann    N8UR         jra@febo.com     http://www.febo.com
President, TAPR                n8ur@tapr.org    http://www.tapr.org



---------- End Forwarded Message ----------



----
John Ackermann    N8UR         jra@febo.com     http://www.febo.com
President, TAPR                n8ur@tapr.org    http://www.tapr.org


---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org
```

12. [tacgps] Fw: Z3801A HP GPS RECEIVERS (fwd) (fwd)

```
From: John Ackermann   N8UR <jra@febo.com>
Date: Wed, 22 May 2002 10:54:10 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-80386-2002.05.22-10.29.51--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain
```

I screwed up and sent the same message both times. This is the *other* guy
with Z3801A's for sale.

Sorry.

John

```
---------- Forwarded Message ----------
```

Date: Monday, May 13, 2002 8:51 PM -0400
From: mlerra <mlerra@its-mart.com>
To: jra@febo.com
Subject: Fw: Z3801A HP GPS RECEIVERS

 Subject: Fw: Z3801A HP GPS RECEIVERS

  HEWLETT PACKARD GPS RECEIVER FOR SALE $355.00 USD

  50 AVAILABLE

  Marco Lerra
  ITS-Mart, Inc.
  SPACE COAST TECHNOLOGY
 465 Turtle Circle
  Satellite Beach, FL 32937
  Tel: 321-777-6035
  Fax: 321-777-2840
  Email: mlerra@its-mart.com
  Web: www.its-mart.com

> >
>

---------- End Forwarded Message ----------

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

---------- End Forwarded Message ----------

John Ackermann   N8UR   jra@febo.com   http://www.febo.com
President, TAPR   n8ur@tapr.org   http://www.tapr.org

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

13. [tacgps] HP 10811-60111

From: Mark Miller <markm@kramrellim.com>
Date: Mon, 27 May 2002 13:41:52 -0500
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81497-2002.05.27-14.17.43--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

I have a HP 10811-60111 in a HP5328A that I think has a problem. The
counter started acting erratically, and when I checked the 10MHz signal on
a scope, it was very rough looking (non-sinusoidal). I don't know if this
is normal. My oscillator is connected to a board with a sma connector that
connects to the back of the counter to a BNC. Does anyone on the group
know where I can get a schematic of the oscillator and this PC board?

Thanks
73
Mark N5RFX

You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

14. [tacgps] RE: HP 10811-60111

From: "Bruce Rahn" <brahn@woh.rr.com>
Date: Mon, 27 May 2002 15:02:50 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>

Message-ID: <LYR6754-81503-2002.05.27-14.39.15--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Mark,

Before you dig into the oscillator module, check the power supply in the HP
5328A. I've observed erratic operation and crummy waveforms when one or
more of the capacitors in the power supply are failing/have failed.

Good luck!

Regards -- Bruce

Bruce Rahn
WB9ANQ
brahn@woh.rr.com

Wisdom has two parts:
1. having a lot to say; and
2. not saying it!

-----Original Message-----
From: bounce-tacgps-5626@lists.tapr.org
[mailto:bounce-tacgps-5626@lists.tapr.org]On Behalf Of Mark Miller
Sent: Monday, May 27, 2002 2:42 PM
To: TAPR Special Interest Group
Subject: [tacgps] HP 10811-60111

I have a HP 10811-60111 in a HP5328A that I think has a problem. The
counter started acting erratically, and when I checked the 10MHz signal on
a scope, it was very rough looking (non-sinusoidal). I don't know if this
is normal. My oscillator is connected to a board with a sma connector that
connects to the back of the counter to a BNC. Does anyone on the group
know where I can get a schematic of the oscillator and this PC board?

Thanks
73
Mark N5RFX

You are currently subscribed to tacgps as: BRAHN@voyager.net
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---
You are currently subscribed to tacgps as: lyris.tacgps@tapr.org
To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

15. [tacgps] RE: tacgps digest: April 20, 2002

From: "Frank R. Leslie" <fleslie@brevard.net>
Date: Tue, 28 May 2002 17:20:39 -0400
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Message-ID: <LYR6754-81684-2002.05.28-16.56.09--lyris.tacgps#tapr.org@lists.tapr.org>
Rendered body type: text/plain

Re: Rb Cooling

You might try making your own box from alternate layers of Al foil and
polyfoam. The Al conducts heat around to avoid hot spots, while the
polyfoam resists heat transfer. It's something like a space blanket.

Frank

=-
=-=|
| Frank R. Leslie | Pers. email: mailto:f.leslie@ieee.org
|
| 1017 Glenham Drive, NE | Prof. email:
mailto:f.leslie@ieee.org |
| Palm Bay FL 32905-4855 | Home: (321) 768-6629 | KD4EYQ |
020305 |
| 28-01.3130N / 80-35.6136W
|
| www.geocities.com/windy4us   (Wind Energy Experimenters)
|
| www.geocities.com/sun_powered (Outings, Hiking & Wind River trip

advice)|

-----Original Message-----
From: bounce-tacgps-7805@lists.tapr.org
[mailto:bounce-tacgps-7805@lists.tapr.org] On Behalf Of TAPR Special
Interest Group digest
Sent: Sunday, April 21, 2002 2:01 AM
To: tacgps digest recipients
Subject: tacgps digest: April 20, 2002

TAPR Special Interest Group Digest for Saturday, April 20, 2002.

1. RE: Rubidium Cooling
2. RE: Rubidium Cooling
3. RE: Rubidium Cooling

Subject: RE: Rubidium Cooling
From: Mark Miller <markm@kramrellim.com>
Date: Sat, 20 Apr 2002 03:50:33 -0500
X-Message-Number: 1

My Efratom FRK-C2 does not have a heat sink, but there is a place to
mount
one. Does anyone know where I can buy just a heat sink for this Rb osc
?

73
Mark N5RFX

At 23:29 4/19/02 -0400, you wrote:
>Remember that there are reasons that there are reasons the Rb runs hot.
The
>main is that the Rb lamp is hot by its very nature. Then in a properly
>designed system, the xtal will be cut to make use of this as an oven.
>
>If you try to suck out too much heat, the thermal controller in the Rb
will
>just have to work that much harder to make up for the heat you are
>extracting.
>
>The best thing is to try to keep the temperature around it constant.
I'd put
>the Rb in an insulated temp chamber to isolate it from the outside
world. I
>have used a cardboard box and some "OK to be warm" insulating material
so
>that the room's air conditioner doesn't induce changes. But keep the
>temperature stable!
>
>If you put it in a box, affix some sort of temp monitor. I use the
iButton
>(Dallas Semi/Maxim) DS1921 logger and DS1920 or 18S20 one-wire devices
here.
>I'd also watch the current feeding the Rb. There will be a high "cold"
value
>which will throttle back when the oven warms up. You want to minimize
the
>amount of time that the oven is ON by watching for variations in the
supply
>current.
>
>The typical Efratom M100 is quite happy with the small heat sink that
comes
>with them. I've also just bolted them to a large thermal mass (aluminum
>plate) inside the "oven".
>
>To use a Peltier pump to cool it, and then make the oven run more only
helps
>those who want to use more fossil fuels! Save a tree -- 73, Tom
>
>
>
>---
>You are currently subscribed to tacgps as: markm@kramrellim.com
>To unsubscribe send a blank email to leave-tacgps-6754G@lists.tapr.org

---

Subject: RE: Rubidium Cooling
From: "Robert Smith" <bobsmith5@earthlink.net>
Date: Sat, 20 Apr 2002 09:37:39 -0400
X-Message-Number: 2

Lots of heat sinks at http://www.digikey.com .

    Bob Smith

---   Avoid computer viruses, Practice safe hex ---

-- Specializing in small, cost effective
    embedded control systems --

Robert L. (Bob) Smith
Smith Machine Works, Inc.
9900 Lumlay Road
Richmond, VA 23236   804/745-1065

  bobsmith5@earthlink.net

----- Original Message -----
From: "Mark Miller" <markm@kramrellim.com>
To: "TAPR Special Interest Group" <tacgps@lists.tapr.org>
Sent: Saturday, April 20, 2002 4:50 AM
Subject: [tacgps] RE: Rubidium Cooling

> My Efratom FRK-C2 does not have a heat sink, but there is a place to
mount
> one. Does anyone know where I can buy just a heat sink for this Rb
osc ?
>
> 73
> Mark N5RFX
>
> At 23:29 4/19/02 -0400, you wrote:
> >Remember that there are reasons that there are reasons the Rb runs
hot.
The
> >main is that the Rb lamp is hot by its very nature. Then in a
properly
> >designed system, the xtal will be cut to make use of this as an oven.
> >
> >If you try to suck out too much heat, the thermal controller in the
Rb
will
> >just have to work that much harder to make up for the heat you are
> >extracting.
> >
> >The best thing is to try to keep the temperature around it constant.
I'd
put
> >the Rb in an insulated temp chamber to isolate it from the outside
world.
I
> >have used a cardboard box and some "OK to be warm" insulating
material so
> >that the room's air conditioner doesn't induce changes. But keep the
> >temperature stable!
> >
> >If you put it in a box, affix some sort of temp monitor. I use the
iButton
> >(Dallas Semi/Maxim) DS1921 logger and DS1920 or 18S20 one-wire
devices
here.
> >I'd also watch the current feeding the Rb. There will be a high
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>
>

Subject: RE: Rubidium Cooling
From: kirbybq@hiwaay.net
Date: Sat, 20 Apr 2002 10:37:19 -0500 (CDT)
X-Message-Number: 3

For Dan:

Peltier junctions were out of the question - too much power draw
considering
the battery backup system. My battery system is set up to hold the
system up
for 48 hours. Current drawn by system is around 500 ma/hr after the
rubdium is
warmed up. I use 28 a/h batteries and if I go much bigger, they would
have to
go outdoors.

For Mark:

The rubidium heatsink is not very big. Its a little over 1/8 inch thick
at the
base and fits over the end where the frequency ajustment access is. It
has 12
fins, 6 on the left side and 6 on the right side. The fins are around
1/8
thich, with about the same for spacing in between. They are about 3/4
of an
inch long. The center of the heatsink has not fins.

For Donald:
I have reservations on disciplining the rubidium against GPS, as have
never
seen any performace data on the rubidium after modification. I do not
have
long term access to a cesium or maser to compare it after modification.
WHile
I'm sure that it works in the long term, I am specifically concerned
with what
it does in the short term. If you look at Allan variances for GPS vs.
rubidium, the rubidium has much better short term stability, until you
reach an
elasped time of 10,000 seconds or so. A lot of rubidiums are better
than a
normal cesium as far as short term stability in the range of 100 to 1000

seconds. Temp is the worst environmental effect on the FRK rubidium.
Its
rated to hold 1-E9 from -25C to 65C. What I found from my recorded
data, is if
I can hold it at 70F, its very stable - in low parts of -E12.

I appreciate everybody's comments - Dr Clark hit it on the head. I need to
determine the temp where the heaters are at minimum operation and the maximum
temp to stabilize it considering the ambient environment.

Sounds like I need to retain the heat inside of the unit. My thought is to
wrap the unit with some of the foam backed foil insulation and leave the heat
sink exposed. Then a temp proportional control fan circuit mounted away from
the heatsink, so it works without cooling, and when needed the fan comes in
slowly, so the temp does not change fast. Maybe a current sense circuit, so
the fan cannot come on when the heaters are running.

Thanks - 73s - KD4FMN - Brian

Be sure to listen for the Northeast Alabama 6M club on 50.150 Mhz, Monday thru
Friday at 9PM Central time when the band opens. webpage at
http://www.neasmn.org/

END OF DIGEST

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